ANNUAL SANITARY REPORT

OF THE

PROVINCE OF ASSAM

FOR THE YEAR

1919.

SHILLONG:

PRINTED AT THE ASSAM SECRETARIAT PRINTING OFFICE.

1920.

Price 12 *annas.*] [*Price* 1*s.* 6*d.*

Agents for the Sale of Books published by the Assam Administration.

Agents in India.

(1) Messrs. Thacker, Spink & Co., Calcutta.

(2) Messrs. W. Newman & Co., Calcutta.

(3) Messrs. S. K. Lahiri & Co., Calcutta.

(4) Messrs. A. M. and J. Ferguson, Ceylon.

(5) Messrs. R. Cambray & Co., 6 and 8/2, Hasting Street, Calcutta.

(6) Messrs. Thompson & Co., Madras

(7) Babu Hari Ram Dhar, B.A., Popular Library, Dacca.

(8) Messrs. D. B. Taraporevala Sons & Co., 10, Meadon Street, Fort, Post Box No. 18 Bombay.

(9) The Indian School Supply Depôt, 309, Bow, Bazar Street, Calcutta.

(10) Messrs. Rai M. C. Sarkar Bahadur & Sons, 90-2A., Harison Road, Calcutta.

(11) Messrs. Students & Co., Cooch Bihar.

(12) Messrs. Vas & Co., Madras.

(13) The Standard Literature Co. Limited, 13-1. Old Court House Street, Calcutta,

(14) The Standard Book Stall, Karachi.

15. Mr. Mangaldas Harkisandas, Surat.

(16) Messrs. Karsandas. Narandas & Sons of Surat.

(17) Munshi Seeta Ram, Managing Proprietor, Indian Army Book Depôt Juhi, Cownpore.

Agents in England.

(1) Messrs. Constable & Co., 10, Orange Street, Leicester Square, W. C.

(2) Messrs. Kegan Paul, Trench, Trübner & Co., 68—74, Carter Lane, E. C., London. Oriental Department, 25, Musuem Street, London, W. C.

(3) Mr. B. Quaritch, 11, Grafton Street, New Bond Street, W.

(4) Messrs. P. S. King & Son, 9, Bridge Street, Westminster, S. W., London.

(5) Mr. B. H. Blackwell, 50 and 51, Broad Street, Oxford.

(6) Messrs. Deighton Bell & Co., Limited, Cambridge.

(7) Messrs. Henry S. King & Co., 65, Cornhill, E. C., London.

(8) Messrs. Grindlay & Co., 54, Parliament Street, S. W., London.

(9) Messrs. W. Thacker & Co., 2, Creed Lane, London, E. C.

(10) Messrs. Luzac & Co., 46, Great Russell Street, London, W. C.

(11) Mr. J. Fisher Unwin, 1, Adelphi Terrace, London, W. C.

(12) Messrs. William Wesley & Son, 28, Essex Street, Strand London.

Agents on the Continent of Europe.

(1) M. Earnest Leroux, 28, Rue Bonaparte, Paris,

(2) Martinus Nijhoff, The Hague

(3) Messrs. Oliver and Boyed, Tweeddale Court, Edinburgh.

(4) Messrs. E. Ponsonby, Ltd., 116, Grafton Street, Dublin.

SHILLONG:

PRINTED BY D. C NANDI, OFFG. SUPERINTENDENT, ASSAM SECRETARIAT, PRESS.

No. 3520.

FROM

MAJOR T. C. McCOMBIE YOUNG, M.D., D.P.H., I.M.S.,

SANITARY COMMISSIONER, ASSAM,

To

THE SECOND SECRETARY TO THE CHIEF COMMISSIONER
OF ASSAM.

Shillong, the 30th April 1920.

SIR,

I HAVE the honour to submit herewith the Annual Sanitary Report of the Province of Assam for the year 1919.

I have the honour to be,

SIR,

Your most obedient Servant,

T. C. McCOMBIE YOUNG, *Major, I.M.S.,*

Sanitary Commissioner, Assam.

[Maximum limit of narrative portion of the report, 30 pages.]

CONTENTS.

SECTION X.

GENERAL REMARKS.

SECTION XI.

ANNUAL SANITARY REPORT

OF THE

PROVINCE OF ASSAM

FOR THE YEAR

1919.

SECTION I.

METEOROLOGY.

The Director General of Observatories has furnished the following note on the chief meteorological conditions of the province for the year 1919 :—

I.—The cold weather period, January and February.—Rainfall was below normal during the whole period, the defect being 47 per cent. in January and 68 per cent. in February. The skies were clearer and the air drier than usual in February, but cloud proportion was above normal in January.

II.—The hot weather period, March to May.—The defect in the rainfall persisted in March, April and May, the deficiency being 77, 31 and 26 per cent. respectively. Humidity and cloud were below the average in all the three months ; mean temperature was about 3½° above normal in March.

III.—The south-west monsoon period, June to September.—The monsoon broke about the end of the first week of June, about a week earlier than usual, but the rainfall in June, July and August was in defect by 11, 4 and 36 per cent., respectively ; it was in excess in September by 39 per cent. Skies were decidedly clearer than usual in June and August.

IV.—Retreating monsoon period, October to December.—Rainfall was well above the average in October and November, and below the small normal amount in December. Cloud proportion was much higher than usual during the period.

Price of food-grains and their connection with vital occurrences.

The defect in the rainfall from January to September to which the Director General of Observatories draws attention, appears to have been closely related to the adverse health conditions of the year. Concurrent with the deficient rainfall and more or less as a result of it, the price of common rice, the staple food-grain of the province, was high throughout the year, the amount purchaseable for one rupee being in every district from one to two seers less than it was in 1918. The interaction of these meteorological and economic factors with the dominant factor of the post-influenzal susceptibility of the population to disease, appears to have produced the exceptional unhealthiness of the year which is now under review.

SECTION II.

EUROPEAN ARMY.

(No remarks.)

SECTION III.

NATIVE ARMY.

(No remarks.)

SECTION IV.

JAILS.

(No remarks.)

SECTION V.

General Population.

Vital Statistics.

General census figures. Provincial birth and death rates. Comparison with other provinces.

2. The total population of the plains districts, according to the census of 1911 is 6,051,507, and this population has been, as usual, the basis of calculation for the ratics in this report, but it must be remembered that in the intercensal period, the immigration of labourers to the tea districts, and of Mymensingh Muhammadans to the unoccupied tracts in Nowgong and Goalpara and elsewhere, has added to the population, and that consequently ratios based on the census population must be accepted with reserve.

There has been no change in the areas under registration during the year.

The birth-rate of the province for the year 1919 was 30·52 and is compared below with the rates recorded in other provinces in India :—

Provinces.	Birth-rate.		
	1913-17.	1918.	1919.
1	2	3	4
Assam	32·29	34·98	30·52
Bengal	33·4	32·9	27·5
Bihar and Orissa	40·40	37·51	30·46
Central Provinces	48·11	43·24	34·31
Madras	32·4	28·89	25·52
Burma	34·62	33·01	29·89
Bombay	36·24	31 61	27·90
United Provinces	45·05	39·89	32·39
Punjab	45·2	39·6	40·28
North-West Frontier Province	33·31	30·58	28·62

The birth-rate for the year, although below the average of the quinquennium 1913-17, does not compare as unfavourable with it as do the birth-rates of many other provinces.

The death-rate for the year 1919 was 50·09 and is compared below with the rates recorded in other provinces in India :—

Provinces.	Death-rate.		
	1913-17.	1918.	1919.
1	2	3	4
Assam	27·77	46·10	50·09
Bengal	29·5	38·1	36·2
Bihar and Orissa	31·51	56·71	40·0
Central Provinces	35·77	102·60	43·24
Madras	23·3	43·01	27·23
Burma	25·28	39·59	31·09
Bombay	31·26	88·05	32·53
United Provinces	33·15	82·37	41·69
Punjab	33 4	81 0	28·34
North-West Frontier Province	26·81	70 30	28·66

The death-rate is lamentably high. It is almost twice that of the previous quinquennium, it is higher than that of 1918, the pandemic influenza year, and higher than that of any other province. The increased death-rate appears to have been primarily due to the continuance of the influenza epidemic during the first quarter of the year and secondarily, to an exaggeration of the normal seasonal cycles of morbidity among a population whose bodily resistance had been reduced by epidemic disease and whose environment was economically and meteorologically somewhat unfavourable.

3. The births of the year numbered 184,738—giving a ratio—of 30·52 per mile of population, as compared with 34·98 in 1918 and 32·68, the average of the preceding quinquennium. As compared with the quinquennial average, the decrease in the birth-rate was most noticeable in the districts of Sibsagar, Sylhet, Darrang and Goalpara, and the only districts which returned increased birth-rates were Kamrup and Cachar.

Birth registration—General.

4. The total number of births registered in urban areas during the year was 3,713 and the birth-rate per mille was 31·08, as compared with that of 3,979 and 33·31 per mille in the year 1918. As usual, Barpeta headed the list with a birth-rate of 49·35, other towns returning birth rates above urban average being Maulvi Bazar (36·30), Golaghat (35·77), Nowgong (35·51), Goalpara (34·87), Jorhat (34·60), Sylhet (32·37), Hailakandi (32·14), Gauhati (31·64), North Lakhimpur (31·61) and Tezpur (31·18). The only town which reported a birth-rate below 20 per mille was Sibsagar (18·39) but not much reliance can be placed on the accuracy of this figure.

Birth registration in urban areas.

5. The total number of births registered in rural areas during the year was 181,025 as compared with 207,738 in the preceding year, showing a decrease of 26,713 or 4·51 per mille of population. Among rural circles considered individually, the Seleng circle in Sibsagar district reported the highest birth-rate, *viz.*, 79·08, other circles reporting rates above the provincial average were 15 circles in the district of Goalpara, 8 in Kamrup, 6 in Darrang, 5 in Nowgong, 3 each in Sylhet and Cachar, 2 in Lakhimpur and 1 in Sibsagar. Rates of 20 and below were reported from Boko (19·07), Behali (18·14), Majuli (13·98), Udalguri (11·41), Lumding (9·48) and Margherita (4·55) but as explained in the last report, detailed criticism of these figures is unprofitable, as immigration and the redistribution of circles since the last census have rendered unreliable the population figure on which these ratios are calculated.

Birth registration in rural area.

6. The number of deaths registered during the year was 303,133 giving a ratio of 50·09 per mille, as compared with 46 10 in the year 1918 and 31·46, the quinquennial average. The highest rate of 60 74, was reported from the district of Darrang followed by Sibsagar (53·58), Lakhimpur (53·56), Cachar (53·45) and Sylhet (52 95). The death-rate for the year exceeded the quinquennial average in every district.

Death registration—general.

7. The total number of deaths registered in urban areas in which the registration is compulsory was 4,459 as compared with 3,949 in 1918, showing an increase of 510. Rates above the provincial urban average of 37·33 were recorded by Mangaldai (74·92), Golaghat (50·08), North Lakhimpur (48·63), Sylhet (40·25), Dhubri (43·21) and Gauhati (40·70) excluding the deaths of tea-garden emigrants in the two last named towns.

Death registration in urban areas.

8. The total number of deaths recorded in rural areas during the year was 298,674 as compared with 275,085 in 1918, yielding annual ratios of 50·35 and 46·37 per mille, respectively, the quinquennial average death-rate being 31·56.

Death registration in rural areas.

9. The sub-joined table shows the result of the enquiries conducted by the vaccination inspecting staff in urban areas to test the accuracy of registration of vital statistics during the non-vaccination season of the year 1919 :—

Registration in compulsory areas. Prosecutions under Act IV (B.C.) of 1873.

Municipalities.	Unregistered vital occurrences detected during 12 months from October 1918 to September 1919.		Recorded vital occurrences during 12 months from October 1918 to September 1919.		Percentage of omissions.	
	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
1	2	3	4	5	6	7
Silchar	...	...	85	42	...	...
Hailakandi...	1	1	36	85	2·70	1·16
Sylhet	6	12	339	419	1·73	2·78
Karimganj	16	15	64	46	20 00	24·59
Maulvi Bazar	8	...	74	81	9·75	...

Municipalities.	Unregistered vital occurrences detected during 12 months from October 1918 to September 1919.		Recorded vital occurrences during 12 months from October 1918 to September 1919.		Percentage of omissions.	
	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
1	2	3	4	5	6	7
Habiganj	...	1	153	169	...	·58
Sunamganj	12	20	109	150	9·91	11·76
Dhubri	11	18	191	542	5 44	3·21
Goalpara	4	14	329	375	1·20	3·59
Gauhati	34	9	345	791	8 97	1·12
Barpeta	22	14	464	525	4·52	2·59
Tezpur	10	5	212	162	4·50	2·99
Mangaldai	2	2	13	38	13·33	5·00
Nowgong	13	11	169	223	7·14	4·70
Sibsagar	18	3	106	68	14·51	4·22
Nazira	14	21	235	204	5·62	9·33
Jorhat	14	6	167	173	7 73	3·35
Golaghat	14	26	72	159	16·27	14·05
Dibrugarh	18	20	259	151	6·49	11·69
North-Lakhimpur	...	...	...	...	...	...
Shillong	34	4	398	438	7·87	·91
Total	251	202	3,820	4,833	6·16	4·00

The deduction to be drawn from these figures appears to be that the defect in registration may be, in places, as much as 20 per cent. and that its discovery depends to some extent on the energy of the investigator. The average fine for omissions to register births and deaths was 0-13-5 per head. Out of 40 cases sent up for trial in Golaghat, only 4 were convicted, a circumstance which seems to indicate undue leniency or faulty procedure, or both.

Registration in hill districts.

10. The following statement shows the recorded birth and death rates in hill districts in 1919, as compared with those of 1918 :—

Districts.	1919.		1918.	
	Birth-rate.	Death-rate.	Birth-rate.	Death-rate.
1	2	3	4	5
Khasi and Jaintia Hills	21·28	29·32	27·45	55 72
Naga Hills	10·02	34·20	15·46	47·71
Lushai Hills	39·13	65·60	40·43	35 55
Garo Hills	23·83	26·27	25·64	34·99

The year was an unhealthy one in all the hill districts, where the death-rates appreciably exceeded the birth-rates, but the Lushais seem to have suffered the most, for the death-rate of 33 98 in the Lushai Hills from "respiratory diseases," which includes mortality from influenza, was high. It is reported that Aijal subdivision suffered from influenza more than the Lungleh subdivision, and the Superintendent of the district attributes "the high death-rate of the year largely to the results of malnutrition as a result of scarcity." He adds that "the prompt localization and suppression of a virulent small-pox outbreak is creditable to the medical staff, and to the Lushai custom of isolating villages in which infectious disease appears." The Civil Surgeon

Lushai Hills, brings to notice the prevalance of malaria, and the Civil Surgeon, Garo Hills, likewise attributes the unhealthiness of the year to an unusual prevalence of that disease. The population of the area under registration in the Naga Hills is only 4,590 and the main causes of mortality during the year 1919 are said to have been fever (12·63) and respiratory disease including influenza (16·99). In the North-East Frontier district 292 births and 303 deaths were recorded during the year 1919, against 387 and 943, respectively in 1918 and the mortality recorded under "Fever" was very high.

Registration in tea gardens.

11. The sub-joined table shows the birth and death rates reported from tea estates for the year 1919, as calculated on the census population of 1911:—

Districts.	Birth-rate.	Death-rate.
1	2	3
Cachar	28·16	66·23
Sylhet	29·93	78·67
Goalpara	63·71	106·19
Kamrup	10·09	30·94
Darrang	35·55	101·85
Nowgong	19·81	69·89
Sibsagar	33·76	98·09
Lakhimpur	33·15	82·29
Total	31·58	83·82

As nearly one quarter of a million labourers were recruited during the year from famine-stricken areas during the prevalence of cholera and influenza, the figures being those of an abnormal year are not fairly comparable with those of previous years, and the ratios being disturbed by immigration are obviously incorrect. One may, however, note that the birth-rate in the tea districts of Darrang, Sibsagar and Lakhimpur was above the provincial average, (although the new importations contributed little or nothing to it), while that of the tea districts in Sylhet and Cachar was below the provincial average. The death-rate was, as is to be expected, a high one, but the ratio is inflated by being calculated on a smaller population than that to which it referred.

Registration on railways.

12. The total number of births and deaths recorded within railway limits was 47 and 918, respectively, as compared with 78 and 431, respectively in 1918. Four hundred and four deaths out of 918 were attributed to influenza.

Seasonal incidence of births and deaths.

13. As usual the birth rates recorded in the months of October, November, December and January were the highest, and the lowest rates were recorded in June and July.

The death-rate was highest in the month of January, the cause being the continuation during that month, of the influenza epidemic of 1918. In February the rate went down a little but it was still above the average throughout the year. March, April, May and June were months in which cholera was unusually prevalent, June, July and August were the months in which malaria was rife, while influenza in a sporadic form was prevalent throughout the year.

Mortality according to age, sex and class.

14. The details of registration of deaths according to age, sex and class are furnished in statements Nos. II, IV and V appended to this report. The infantile mortality calculated on the number of births registered in the year was 239·79 per 1,000 (250·01 for males and 228·90 for females) as compared with 216·95 in 1918.

Inspection of village register of vital statistics.

15. The vaccination inspecting staff checked 85,131 entries of births and deaths and detected 3,810 omissions and the percentage of omissions detected to the total number checked was 4·47 as compared with 4·42 in the preceding year. The highest percentage of omissions (10·25) was detected in the district of Kamrup, in which an investigation into defective registration was conducted, and the lowest percentage of omissions was detected in the district of Nowgong in regard to which the Civil Surgeon of Nowgong remarked in his report that "gaonburas are steadily

rising to their responsibilities in view of certain incentives from Government in the shape of remissions of land revenue, monetary rewards and others given for efficient work." A systematic inspection of one of the circles in the district of Sibsagar in which registration appears unusually bad, was ordered but escaped attention. In Darrang, Goalpara, and Cachar the amount of verification done was small.

General accuracy of vital statistics and improvement effected during the year.

16. There has been no change in the agencies for the collection of vital statistics either in urban or rural areas, in the year under report.

SECTION VI.

History of chief diseases.

Chief causes of mortality.

17. The following table shows the death-rate per mille from each of the chief causes of mortality during the year 1919 as compared with those for the decennium ending 1918 :—

Disease.	1909-18.			1919		
	Urban.	Rural.	Combined.	Urban.	Rural.	Combined.
1	2	3	4	5	6	7
Cholera	1·94	2·57	2·56	2·31*	5·63	5 61
Small-pox	·68	·50	·50	·05	·24	·23
Plague	...	...	...	...	...	...
Fevers	8·72	16·06	15·92	8·81	25·85	25·52
Dysentery and Diarrhœa	3·14	2·39	2·40	4·55	3·32	3·35
Respiratory diseases	2·01	1·41	1·42	6·38	7 98	7·98
Injuries	·48	·32	·32	·62	·34	·34
All other causes	6·63	6·06	6·07	9·99	6 97	7·03
Total ...	23·63	29·34*	29·23	32 71*	50·35	50·09

* Note.—Excluding deaths among emigrants *en route* to tea gardens.

The above figures show an unusual prevalence in 1919 of intestinal and respiratory diseases, including influenza, both in urban and rural areas, and fever, presumably malarial fever, in rural areas.

Influenza.—Although generalisations as to influenza, which are necessarily based on incomplete and unreliable reports, are liable to be inaccurate and misleading, yet it is undeniable that the prevalence of this disease played an important part in the morbidity of 1919 and an attempt must be made to sift some salient facts and credible surmises from the mass of varied information at our disposal regarding it.

In last year's report an attempt was made to estimate the influenza deaths by deducting from the mortality for the year under "fevers," "respiratory disease" and "all other causes," the average under these headings of the preceding quinquennium, and by adding the resultant figure to that for deaths returned as influenza. This method is inapplicable to the statistics for the whole of 1919, as malaria as well as influenza was prevalent, one epidemic apparently following the other without any very definite gap between them. All Civil Surgeons are agreed that the time of greatest influenza prevalence was in the early months of the year, when malarial disease is least active, and accordingly on the assumption that malaria mortality during January,

February and March is insignificant, the subjoined table has been prepared in order to get an idea of what was happening when influenza was at at its worst :—

Districts.	Fevers.		Respiratory diseases.		All other causes.		Total of columns 2, 4 and 6.	Total of columns 3, 5 and 7.	Excess of column 8 over column 9.	Influenza recorded as such.	Total mortality from influenza. Total of columns 10 and 11.	Ratio per 1000.
	1919.	Average of quinquennium ending 1917.	1919.	Average of quinquennium ending 1917.	1919.	Average of quinquennium ending 1917.	1919.	Average of quinquennium ending 1917.				
1	2	3	4	5	6	7	8	9	10	11	12	13
Cachar	1,868	1,198	284	95	969	795	3,121	2,088	1,033	1,912	2,945	6·26
Sylhet	14,914	6,499	641	483	7,098	5,481	22,653	12,463	10,190	12,220	22,410	9·06
Goalpara	4,522	3,443	53	21	211	199	4,786	3,663	1,123	1,505	2,628	4·37
Kamrup	2,878	1,692	91	51	508	453	3,477	2,196	1,281	97	1,378	2·06
Darrang	1,696	1,358	582	151	542	486	2,820	1,995	825	2,679	3,504	9·28
Nowgong...	1,291	841	62	22	268	236	1,621	1,099	522	673	1,195	3·93
Sibsagar	2,693	1,498	338	182	755	738	3,786	2,418	1,368	3,354	4,722	6·84
Lakhimpur	1,941	988	372	257	843	657	3,156	1,902	1,254	2,235	3,489	7·43
Khasi and Jaintia Hills ...	156	58	3	5	212	139	371	202	169	66	235	4·33
Naga Hills	3	7	45	3	5	4	53	14	39	...	39	8·49
Lushai Hills	344	196	1,316	290	185	95	1,845	581	1,264	...	1,264	13·85
Garo Hills	293	153	1	3	10	16	304	172	132	...	132	2·99
North-East Frontier ...	62	31	...	...	...	...	62	31	31	...	31	...
Total ...	32,661	17,962	3,788	1,563	11,606	9,299	48,055	28,824	19,231	24,741	43,972	7·03

This estimate shows 43,972 deaths as being due to influenza during the first quarter, giving a death-rate of 7·03 per 1,000 out of the total death-rate of 13·72 per 1,000 for the quarter, the mean death-rate for this quarter during the non-influenza period of 1915-17 being 5·86. The credibility of this estimate may be tested by adding to the mean death-rate for the quarter (5·89), the estimated influenza death-rate, 7·03. The resulting figure 12·89 per 1,000, which would theoretically be the normal mortality *plus* the influenza mortality, is only a little less than the recorded mortality of 13·72 per 1,000 and it suggests that the statistical jugglery involved in the above calculation is not entirely illusory in its results. Turning to the district reports, we find that in Sylhet and Cachar there was a severe outbreak in the early part of the year, which was evidently a continuation of the 1918 pandemic, terminating about the end of March. In the Assam Valley, the lower districts seem to have suffered less by comparison and the mortality in Goalpara from influenza was estimated to be 3·71 as against 12·91 in 1918, while in Kamrup and Nowgong the disease throughout the year was less virulent, sporadic in occurrence, and more amenable to treatment. In Sibsagar, on the other hand, although there was no well defined wide-spread epidemic, cases occurred throughout the year, and the disease caused as many deaths as in the last five months of 1918. In Lakhimpur, there were 5,496 deaths recorded as against 6,220 in 1918 and in tea gardens the highest mortality was recorded in April. The Civil Surgeon, Darrang, notes a recrudescence in the Tezpur subdivision commencing in May and he describes the disease as being mild in type and with an almost negligible infectivity.

The Khasi and Garo Hills seem to have suffered little from influenza during 1919, but in the Lushai Hills the disease was intense until the end of April, particularly in the Aijal subdivision, the result being evidenced in a mortality ratio of 65·6 as contrasted with the decennial average of 33·6. In regard to the Naga Hills, the Civil Surgeon states in an uninformative report that there were no epidemic, a statement which does not seem compatible with a recorded death-rate of 69·57 per mille among the population under registration.

From these facts and figures it seems legitimate to assume that influenza was still generally active in the first quarter of the year when it caused considerable mortality, that the pandemic fire took longer to burn itself out in some districts than in

others and that after the passage of the conflagration, local recrudescences of low infectivity and diminished virulence have continued to rekindle in its track.

18. Cholera :—

Districts.	Death-rate per mille.	
	1909-18.	1919.
1	2	3
Cachar	1·99	6·76
Sylhet	2·75	5·98
Goalpara	2·28	1·74
Kamrup	3·45	6·55
Darrang	2·92	9·71
Nowgong	3·95	5·95
Sibsagar	1·93	5·68
Lakhimpur	·96	2·60
Total ...	2·56	5·61

As compared with the decennial average the mortality from cholera was high in all districts except in Goalpara.

High rates of mortality from cholera in individual towns and rural areas.

19. Amongst towns the highest rate of 34·60 per mille was recorded in the town of Dhubri but this included 184 deaths among tea-garden emigrants landed from river steamers, who died in the cholera hospital, and excluding these extraneous cases, the ratio for the town was 2·29 and the next highest rate was recorded in the town of Mangaldai (22·93) followed by Golaghat (11·18) and Barpeta (9·31). The appearance of the disease in these towns, the sanitary defences of which leave much to be desired, seems to have been, as usual, due to importation of the disease from adjoining rural areas, in which it was prevalent. In the town of Gauhati, 109 deaths from cholera were reported, but all of them were among emigrant patients in the emigration cholera hospital and none were towns-people and these figures would appear to show that the apprehensions of those who consider the emigration traffic to be a danger to the health of the town of Guahati are unfounded. As for rural areas individually, Barpeta circle in Kamrup, Kalaigaon, Mangaldai and Ghopur circles in Darrang, Bokakhat in Sibsagar, and Kanairghat in Sylhet suffered most.

In regard to the outbreak in the Barpeta subdivision, the Civil Surgeon Rai Bahadur N. P. Neogi, who personally investigated the outbreak and directed the preventive measures which were attempted, reported that the infection was apparently imported from Mymensingh in the persons of certain Muhammadan settlers, that it started at Kolabandha on the Brahmaputra, and extended from thence through the subdivision, the chief mechanism of its conveyance, once a village became infected, being through the pollution of the surface wells, which form the chief source of their water-supply. He and others attribute the undue prevalence of cholera to the shortage of rainfall, and while there were doubtless other potent factors at work in its production, there seems some reason to admit the close relation which exists between deficient rainfall and an undue prevalence of cholera in Assam.

Cholera in tea estates.

20. The ratio of mortality from cholera in tea estates during the year 1919 was 7·73 as compared with 1·82 in the preceding year, for tea estates in all districts shared the increased mortality which occurred among the general population. In view of the famine stricken state of the unusually large number of labourers imported by the industry during the year, and the prevalence of cholera among them in the first half of the emigration season, this high figure requires no further explanatory comment.

21. Small-pox :—

Districts.	Death-rate per mille	
	1908-18.	1919.
1	2	3
Cachar	·34	·03
Sylhet	·28	·16
Goalpara	·62	·66
Kamrup	1·38	·13
Darrang	·54	·19
Nowgong	·88	·02
Sibsagar	·58	·58
Lakhimpur	·08	·09
Total ...	·50	·23

In our survey of the death-rates for 1919, the comparatively low death-rate from small-pox forms one of the few bright spots in a gloomy view. It is matter for congratulation that to the ravages of influenza, malaria and cholera, those of small-pox were not superadded, and one ventures to hope that the efforts that have been made of late years to increase the number of vaccination operations by an increase in the number of vaccinators employed, are not unconnected with this comparative immunity.

In Nowgong where district vaccination has been assiduously and successfully pushed by the District Officers, the maintenance of the low small-pox death-rate is worth the attention of other districts where similar results might be obtained. In particular the Local Boards of Habiganj, Karimganj, South Sylhet and Mangaldai, might with advantage compare their small-pox mortality with that of Nowgong and reconsider their refusals to employ the number of vaccinators necessary to vaccinate a larger number of their children.

High rate of mortality from small-pox in individual towns and rural areas.

22. The highest urban rate of 1·52 was reported by the town of Mangaldai, among a population of 654, in which however, urban conditions can hardly be said to prevail. Mangaldai subdivision is not a well protected subdivision and the infection was probably introduced from the badly vaccinated rural areas. The Mangaldai Local Board has shown some reluctance to employ the number of vaccinators which is necessary for the proper performance of district vaccination, but with Government assistance this has been partially overcome. As for rural circles Bijni Duar, Sidli, and Forest village circles all in Goalpara district, reported rates of 7·88, 6·25 and 4·21, respectively, but the accuracy of the census population of these circles is suspected. Dergaon circle in Sibsagar reported a rate of 3·01 and it is probable that this is to some extent an incorrect ratio, due to an increase in the population by immigration, but it must be admitted that there are still some religious sects in this district who oppose vaccination on sectarian grounds and these form disease foci from which infection tends to spread elsewhere. Other circles in this district which reported rather high rates are Sonari (1·18), Jorhat (·74), Golaghat (·51) and Bokakhat (·45).

23. Fevers :—

Districts.	Death-rate per mille.	
	1909-18.	1919.
1	2	3
Cachar	13·04	24·17
Sylhet	13·05	28·04
Goalpara	29·92	35·15
Kamrup	18·37	22·12
Darrang	20·17	21·25
Nowgong	17·80	22·94
Sibsagar	12·49	20·72
Lakhimpur	12·89	18·20
Total ...	15·92	25·52

The rate for deaths recorded as fever during the year is an unusually high one in every district, but most of all in those of the Surma Valley.

Obviously it is not possible to decide what amount of the 'fever' death-rate was composed of deaths caused directly by influenza itself, but in Sylhet it seems to have been possible to differentiate between the continuance of the influenza pandemic through January, February and March, and its replacement by a disease of malarial type in the succeeding months, and most Civil Surgeons are agreed that the main stress of the influenza epidemic was over by April. While no very precise observations based on laboratory examinations are available to fix beyond doubt the exact cause of the fever epidemic which followed it, all seem satisfied that it was due to malaria.

The plains districts were not the only areas affected, for some little time after the appearance of the epidemic in the plains districts Manipur was affected as was evidenced by the large demands for quinine, and so also were other hill districts, and to a less extent, the Assam Valley Districts. In regard to the Khasi and Jaintia Hills, I append an interesting note by the district Civil Surgeon, Major L. B. Scott, I.M.S., in which he comments on the unusual prevalence of malaria in his district during the year :—

"In the summer months of 1919 there was a very unusual amount of malaria in Shillong and its neighbourhood. There were many undoubted cases of local infection among the European residents, and the indigenous population of Shillong and the villages all round suffered severely. Malaria carrying species of anopheles were found in Shillong. Probably the whole of those hills except the highest parts in the neighbourhood of the 6,000 feet level, were similarly afflicted. Dr. Williams at Jowai informs me that he found a very unusual prevalence of enlarged spleens and fever on his return from England in December. I made a rough malarial survey of the villages round Shillong and a few near Cherra by making a spleen census among the children while inspecting vaccination. I append a table showing the results. It will be seen that there was a large p rcentage of enlarged spleens even in villages as high as 5,600 feet. In villages at 5,800 feet and upwards on the other hand no enlarged spleens were found. The people in many of these infected villages said that this was a new disease which they had never experienced before within a living memory. This is probably true. In most years in these malaria certainly does not extend up to 4,500 feet level and probably not much above the 3,000 feet level."

Figures of Spleen Census, November 1919 *to January* 1920.

Name of villages.	Locality.	Elevation.	Date of Examination.	Number of children examined.	Splenic Index.
1	2	3	4	5	6
(1) Round Shillong—					
Pamnakrai and Mawtharia ...	Five miles south of Shillong, on road to Laitlyngkot	6,100	9th Jan. 1920	26	0·0
Mawphlang	Thirteen miles south-west of Shillong.	6,100	11th ,, ,,	84	0·0
Laitlyngkot	Nine miles south of Shillong	6,000	20th Nov. 1919	44	0·0
Marbisu	Nine miles south-west of Shillong.	6,000	27th ,, ,,	67	0·0
Dympep and Mawkdok ...	Twelve miles south-west of Shillong.	6,000	26th Jan. 1920	9	0·0
Sadew...	Six miles south-west of Shillong.	5,800	27th Nov. 1919	11	0·0
Mawklot	Three and half miles south-west of Shillong.	5,600	8th ,, ,,	8	12·0
Upper Shillong and Pyrda ...	Two and half miles south-west of Shillong.	5,300	8th ,, ,,	46	61·0
Umlyngka	Two miles west of Shillong ...	5,000	8th ,, ,,	87	45·0
Mawpat, Nongrah and Nongpyngrup.	Three and half miles north-east of Shillong.	5,100	1st Feb. 1920...	41	9·0
Nongpathaw and Nongmawrah	Four miles north-west of Shillong on Diengiei Hill.	4,600	30th Nov. 1919	46	59·0

Figures of Spleen Census, November 1919 *to January* 1920—concluded.

Name of villages.	Locality.	Elevation.	Date of examination.	Number of children examined.	Splenic Index.
1	2	3	4	5	6
(2) Near Cherrapoonjee— Cherrapoonjee	.....	4,500	20th Jan. 1920	27	0·0
Wahlong, Mahadek and Sohbar	Four and half miles south-of Cherra.	2,000 to 2,500	21st „ „	25	32·0
Mawlong and Umwai ...	Four miles south-west of Cherra.	2,000	24th „ „	30	23·0
Therria	Six and half miles south of Cherra.	100	22nd „ „	5	100·0

The meteorological data in paragraph 1 of this report show an abnormal deficiency of rainfall in the Surma Valley districts, and regarding the connection between deficient rainfall and excessive prevalence of malaria in country normally liable to inundation, we have the affirmative evidence of malarial research workers in Bengal. Intimately associated with this defect in rainfall was the prevailing high price of the staple food-grain of the province, a condition which elsewhere has been shown to be associated with an increased prevalence of malarial fever. A third, and perhap the predominant factor was the diminished resistance to disease of a population through which a pandemic of influenza had but recently passed. On these epidemiological facts, one can attempt to frame as follows a more or less credible explanation of the reasons of the prevalence of malaria. In a year of low rainfall, in the low-lying lands of Sylhet and Cachar, puddles, backwaters and eddies formed where sheets of running water should have existed and on the available amount of 'edge' thus enormously multiplied, an increased number of carrier mosquitos found congenial breeding grounds. Thus the transmitting agents of the malaria parasite being unusually numerous, the malarial parasite itself, finding a diminished resistance in the bodies of people weakened by influenza and less well fed than usual, multiplied and flourished exceedingly, the result being a notable increase in the 'fever' death-rate.

A visit was paid to Pasighat to inspect the progress of the anti-malaria measures there, which although incomplete, are promising. The anti-malarial operations at Lumding carried out by the Assam-Bengal Railway are again under the control of a medical officer with a knowledge of malariological technique, under whom with efficient maintenance and a continuance of the auxiliary operations, the scheme may be expected to have the desired result of affecting a very material reduction in the malariousness of the station.

Typhoid fever.

In August and Sptember, Shillong was visited by an outbreak of typhoid fever, some 25 Indians and 8 Europeans being attacked. Under my supervision, Sub-Assistant Surgeon Benoy Kumar Das was deputed to make an inquiry into the cause of the outbreak, and his enquiries elicited the fact that the majority of the Indian cases had obtained their milk from Maolai, a Khasi village just outside the municipal boundary. It was then discovered that a large number of persons in this village had suffered from a suspicious type of fever and that one of the goalas, who supplied most of the suspicious milk, had recently been a patient. A specimen of his blood tested at the Pasteur Institute gave a marked agglutination reaction for typhoid, and this and other relevant observations seemed to warrant the presumption that the initial infection had been conveyed to Shillong in the Maolai milk and then carried from house to house by direct infection. It appeared that some of the European cases might also have derived their infection from Maolai milk, but the spread to the European quarters appeared to have been dependant to some extent in the habits of Shillong servants, who live in the bazar, coming and going without control, and carry disease to employers who are unable to trace their antecedents owing to the absence of any system of registration. Unfortunately typhoid fever is endemic in the Khasi Hills and its importation to Shillong from outside villages in food supplies is an annual possibility against which Municipal and domestic vigilance should always be maintained.

High rates of mortality from fevers in individual towns and rural areas.

24. Rates higher than the urban average were returned by the towns of Nazira (28·26), North Lakhimpur (27·35), Mangaldai (24·46), Maulvi Bazar (21·10), but in these towns,

of which the population is small, there is no medical registrar of births and deaths and the diagnosis is untrustworthy. As for rural circles, 16 circles in the district of Goalpara returned ratios over the provincial rural average of 25·85, 9 in Sylhet, 6 in Lakhimpur, 4 in Darrang and 3 each in Sibsagar, Cachar and Nowgong.

25 *Kala-azar.*—

Districts.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.
1	2	3	4	5	6	7	8	9	10	11
Cachar	2	3	2	8	...	2	...	1	4	3
Sylhet	866	549	394	444	203	159	63	31	34	7
Goalpara	87	135	192	206	138	55	106	153	313	311
Kamrup	450	354	385	294	215	283	277	287	564	423
Darrang	627	679	563	399	317	310	320	245	263	171
Nowgong	221	286	308	417	393	419	451	591	565	559
Sibsagar	...	34	31	29	24	7	28	181	235	168
Lakhimpur	50	11	...	...	8	...	3	1	3	5
Garo Hills	23	15	16	15	10	12	6	18	22	20
Total ...	2,326	2,066	1,891	1,812	1,308	1,247	1,254	1,508	2,003	1,667

The deaths from *kala-azar* in 1919 were fewer by some four hundred than they were in the previous year. There is a proportionate reduction in the mortality recorded in the Sibsagar subdivision which was 38 in 1917, 105 in 1918 and 71 in 1919. In the Golaghat subdivision, the total was 64 in village areas, showing a slight increase, against which however may be set a decrease in deaths on tea estates, which in 1917 were one hundred and seven, in 1918 seventy-eight, and in 1919 twenty-four. This gratifying decline on tea estates in Golaghat is due to the satisfactory results of the operations carried out at Duria tea estate, where the outbreak is now nearly at an end. The Nowgong figures are large, but those for Kamrup are less than in the previous year.

The campaign against *kala-azar* in the Upper Assam Valley districts and in areas of acute endemic exacerbation, was pressed with vigour throughout the year. It is not possible within the scope of this report to give a detailed account of all the work, but the net result of it appears to show that our measures of segregation and removal from an infected site are successful in controlling local outbreaks in villages, when the removal is carried out over a sufficiently large area. Some of the villages in the Sibsagar subdivision to which in 1917 these measures were applied, are now entirely free from the disease, and others are all but free from it and the inhabitants are being freed from the restrictions of a notified area. On the other hand, in a few, where the excised area did not include the whole of the infected site, or where delay in removal occurred, new cases have come to light in the unsegregated area. Besides these recurrences, we still have to deal annually with a new crop of infected villages which presumably has sprung from the slowly germinating seeds of infection spread abroad before our methods of control were applied.

Experience seems to indicate that by working on our present system we can uproot the weeds of infection when they appear, but the efficiency of our endeavours to prevent the seeds being spread abroad yet remains to be proven, for our methods are necessarily empirical and we can only judge them by their results which are not yet evident. By our methods of segregation, which are real and not nominal, as they are most whole heartedly enforced by the support of public opinion, we confine within very narrow limits the possibilities of spread by human conveyance, but it is not yet proved that this is the only possible means of conveyance and that the movements of the disease from place to place are entirely dependant on the human transmitting factor. Our restrictive regulations are based on this hypothesis, in the absence of any other, and the application as an exact science rather than as an empirical method, of the principles of preventive medicine to the prevention of the spread of *kala-azar*, awaits the elucidation by research of the mechanism of its transmission. The most outstanding feature of the work of the year has undoubtedly been the general introduction of treatment by the intravenous injection of tartar emetic. A special hospital for the treatment of *kala-azar* patients was opened near Nazira in

September. Our first few patients were reluctant to enter and unwilling to remain to the end of their course of injections, but the success of the treatment has proved its own advertisement. Within a few months of opening the hospital we found it necessary to make an increase in the available accommodation for indoor patients, and outdoor patients are now attending by scores daily. The latest developments are that there are few, if any, *kala-azar* patients in the Sibsagar subdivision who are not under treatment in the hospital, and much credit for the success of the institution is owed to the Medical Officer, Assistant Surgeon Dinesh Chandra Bhaumik, and his assistant, Sub-Assistant Surgeon Hem Chandra Baruah. At Kakadanga in Jorhat, at Naharani in Golaghat, at Kathiatoli in Nowgong and at Chotchalja in the Garo Hills, good work in the treatment of outdoor cases of *kalâ-azar* was initiated during the year, the result of which will be shown in next year's report. In the Dudnai thana of the Goalpara subdivision the progress of our work has been far from satisfactory, owing to the unreliable character of the medical subordinates we have employed there, three of whom resigned in succession rather than undergo some slight temporary hardships pending the provision of a hospital and quarters, the work on which was commenced after the close of the year. The outbreak in the Garo village of Chotchalja has been successfully controlled and the bulk of the cases there have come under the treatment of a *kala-azar* travelling dispensary in charge of Sub-Assistant Surgeon Abdul Hafiz. His success suggests the utility of such *kala-azar* travelling dispensaries for 3 months' courses of treatment of the patients of heavily infected villages. After the close of the year another such travelling dispensary in charge of Sub-Assistant Surgeon Amir Khasru was posted to a badly infected Kachari village in the Nambor Forest, where his ministrations are being much appreciated. A simplified practical outfit will be devised for the equipment of two or three such dispensaries which should be maintained in addition to the stationary indoor hospitals and outdoor dispensaries. Outside the work of the special staff, much has been done by the Civil Surgeon of Kamrup, Rai Bahadur N. P. Neogi, to organise outdoor treatment of *kala-azar* in the Local Board and Government dispensaries under his control in the endemic areas round Palasbari and Boko, while in the Nowgong sadr dispensary, under Dr. Dodds Price, a large number of *kala-azar* cases have received treatment. In Shillong, a number of cases were treated in the hospital attached to the Pasteur Institute under Major Knowles, I.M.S., and they were returned cured to their homes as living advertisements of the treatment, to the subsequent popularity of which, in the areas supplied by the above mentioned institutions, a large share must be ascribed. This expansion of the facilities for treatment should have a satisfactory result on next year's death-rate from *kala-azar*, but there is also the possibility, which is being tried experimentally in certain villages under our observation, that treatment of cases will decrease the prevalence of the disease. If the experiment of treating the first few cases in village without their removal from the infected site proves successful in limiting the further spread of the disease to adjoining houses, then our future preventive measures will be greatly simplified. Unfortunately the information to hand at present, although inconclusive, does not encourage one in this hope.

23. *Dysentery and diarrhœa*—

Districts.	Death-rate per mille.	
	1909-18.	1919.
1	2	3
Cachar	2·42	3·45
Sylhet	2·08	2·58
Goalpara	·38	·89
Kamrup	1·07	·96
Darrang	4·26	6·29
Nowgong	1·72	1·96
Sibsagar	4·28	6·36
Lakhimpur	4·72	7·91
Total ...	2·40	3·35

The mortality from dysentery and diarrhoea was greater than the decennial average in all districts except in Kamrup and, as usual, the three tea districts of Darrang, Sibsagar and Lakhimpur in Upper Assam suffered more than the rest. The subjoined table shows the death-rates from these diseases on tea estates in 1919 as compared with the decennial average.

—	1919.	Decennial average.
1	2	3
Goalpara	24·77	30·08
Darrang	22·63	10·08
Sibsagar	21·15	9·15
Lakhimpur	16·68	8·37
Nowgong	14·53	4·95
Sylhet	12·83	5·54
Cachar	7·89	4·20
Kamrup	5·83	3·13

As is to be expected in an unhealthy year with a large importation of unacclimatized and famine-stricken labourers, the ratios for the year compare unfavourably with those for normal years.

A scheme whereby garden managers will be put in touch with firms who can supply on practical business-like terms, the appliances whose installation should effect a substantial reduction in the mortality from such diseases, is now under the consideration of Government.

27. *Plague.*—No case of plague occurred in Assam during the year under report.

28. *Other causes.*—The mortality reported under the head "Injuries" during the year was almost the same as in 1918 and amounted to 2,114 against 2,021, the ratios per 1,000 being ·34 and ·33, respectively.

SECTION VII.

Vaccination.

(Published separately.)

SECTION VIII.

Sanitary Works—Military.

(No remarks.)

SECTION IX.

Sanitary Works—Civil.

General.

29. There were in the province fifteen Municipalities and ten Unions during the year under report.

Municipal expenditure on sanitation.

30. The aggregate income inclusive of the opening balances of fifteen Municipalities and eight Unions (excluding those of Doom Dooma and Tinsukia which have not furnished the information) amounted to Rs. 7,64,093 in 1919, as compared with Rs. 8,07,202 in the preceding year. Of the total receipts, a sum of Rs. 3,27,577 or

42·87 per cent. was spent on different heads of sanitation, the percentages of sanitary expenditure in each of these institutions being in order of sequence as follows :—

1.	Shillong Municipality	57·54
2.	Gauhati „	56·60
3.	Jorhat „	52·40
4.	Sunamganj „	48·78
5.	Sylhet „	47·84
6.	Karimganj „	47·21
7.	Dibrugarh „	45·61
8.	Silchar „	44·01
9.	Maulvi Bazar Union	42·72
10.	Habiganj Municipality	42·31
11.	Tezpur „	40·79
12.	Goalpara „	40·17
13.	Nowgong „	29·98
14.	Barpeta „	29·80
15.	Sibsagar „	28·21
16.	Hailakandi Union	27·07
17.	Dhubri Municipality	21·68
18.	Golaghat Union	17·40
19.	Nazira Union	14·01
20.	Mangaldai Union	10·91
21.	Polashbari „	9·10
22.	North Lakhimpur Union	4·56
23.	Gauripur Union	1·10

The table below shows the expenditure for sanitary purposes incurred during the year 1919, as compared with that of 1918 :—

Heads of expenditure.	Total expenditure.		Difference.	
	1919.	1918.	Increase.	Decrease.
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
1. Conservancy, including establishment, road watering, latrines, etc.	1,91,565	1,76,773	14,792	...
2. Drainage	30,018	16,466	13,552	...
3. Water-supply	87,907	1,51,748	...	63,841
4. Disposal of the dead	531	347	184	...
5. Markets and slaughter houses ...	7,728	6,650	1,078	...
6. Vaccination	2,353	2,217	136	...
7. Other sanitary works	7,475	4,160	3,315	...
Total ...	3,27,577	3,58,861	33,057	63,841
8. Construction and maintenance of roads ...	89,345	78,731	10,614	...
Total including roads ...	4,16,922	4,37,092	43,671	3,841

The decrease under the head "Water-supply" is due to the completion in 1918 of the water-works in Sylhet and the payment of the contractor's bill. Of the total increase of Rs. 14,792 under conservancy, Shillong contributed Rs. 8,000 and Dibrugarh Rs. 4,000.

Sanitary works.

31. A sum of Rs. 11,000, on account of the pay and allowances of ten Sanitary Inspectors posted to certain Municipalities, was provided from the Imperial recurring grant, no other expenditure being incurred from that grant.

Surma Valley and Hill Districts Division.—The water-works in the towns of Silchar and Sylhet worked satisfactorily, although the mechanical filters did not yield as good results bacteriologically as are claimed for them by their supporters. The Shillong water-supply being derived direct from springs, maintained a high standard of purity, but owing to the growth of the station, the supply is insufficient and requires augmentation. A search is being made to discover elsewhere in the catchment area, springs similar to those from which the supply is at present derived, the water of which could be safely impounded to augment the existing water-supply without the intervention of filters which are liable to failure due to mechanical or human faults. Silchar Municipality spent Rs. 963 on construction of drains. A scheme for the improvement of the surface drainage in certain quarters of the Shillong Municipality is in progress and a surface drainage scheme for Sylhet is under consideration.

Assam Valley Division.—The detailed estimate for Dhubri water-works has been sanctioned by the Local Administration and the work is being carried out by the Public Works Department as a contribution scheme. The construction of pucca drains in some quarters of the town of Gauhati is in progress. Goalpara Municipality has provided two public latrines and Barpeta one pucca well and two public latrines but all other minor projects are in abeyance owing to the absence of funds with which to finance them, although many of them might with advantage be taken up. Apart from the Dhubri water-works scheme no new major sanitary engineering projects are in hand in any of the towns, nor indeed are any such at present projected, as practically all the larger towns have been provided with water-works with the exception of Dibrugarh, which does not want them, and the Shillong sewerage scheme seems now to be beyond the capacities of the provincial budget.

A total expenditure of Rs. 67,964 is reported to have been incurred by the Public Works Department on original works and repairs under the heads "Improvements to towns," "Drainage," "Water-supply" and "Miscellaneous improvements" in 1919 in the province, as compared with Rs. 21,193 in the preceding year.

SECTION X.

General Remarks.

Village sanitation.

32. The aggregate expenditure of nineteen Local Boards on the improvement of water supplies amounted to Rs. 69,769 in the year 1919, as compared with Rs. 88,456 in the preceding year and Rs. 2,08,868 in the year before that. It would appear that the absence of the Government grants-in-aid of the 5 years' scheme for the improvement of rural water-supplies has not stimulated Local Boards to greater expenditure on this line of work. The Dhubri Local Board should be noted as having spent Rs. 20,308, of which Rs. 17,274 was incurred in the construction of new wells. Goalpara spent Rs. 1,192 in sinking wells, Mangaldai Rs. 4,428 on tanks and wells, Jorhat Rs. 4,752 on tanks and Sibsagar Rs. 4,367 also on tanks. The proposal for the employment of a staff of rural health officers, one for each plains subdivision, to which reference was made in last year's report, has been accepted by Government in principle, and some provision has been made in the current year's budget to give partial effect to the scheme.

33. The subjoined table shows the quantity of quinine sold, district by district, during the year 1919, as compared with that sold in 1918 :—

Sale of quinine.

Districts.	"Treatment" parcels sold in		Difference.	
	1919.	1918.	Increase.	Decrease.
1	2	3	4	5
Cachar	1,161	1,142	19	...
Sylhet	8,780	5,626	3,154	...
Khasi and Jaintia Hills	1,810	1,381	429	...
Naga Hills	140	216	...	76
Lushai Hills	2,042	1,499	543	...
Goalpara	2,409	2,495	...	86
Kamrup	1,285	1,410	...	125
Darrang	489	583	...	94
Nowgong	812	889	...	77
Sibsagar	912	855	57	...
Lakhimpur	326	405	...	79
Garo Hills	25	37	...	12
Manipur State	309	322	...	13
North-East Frontier	19	20	...	1
Total	20,519	16,880	4,202	563
Net increase	...	...	3,639	...

Of 20,519 parcels of quinine, 13,733 parcels were sold through the agencies of Postmasters, and the remainder through such other agents as school masters, shop-keepers and members of the vaccination inspecting staff. The increase in its consumption over that of last year was greatest in the districts which were most severely affected by malaria and there is little doubt that its value in the treatment of the disease is now widely appreciated. Certain complaints of shortages in the parcels of quinine tablets supplied by the Juvenile Jail, Alipore, Bengal, were brought to the notice of the Jail authorities and no further complaints have been received.

Pilgrim traffic.

34. The only important gatherings of pilgrims in Assam was the Sidheswari Mela a Hindu festival held in the disirict of Cachar. Some 9,000 people visited the mela and under the personal direction of the Deputy Commissioner and Civil Surgeon arrangements were made, including the provision of temporary sanitary conveniences, which were successful in preventing any outbreak of epidemic disease.

Railway coolie camps.

35. There were three railway coolie camps under the Assam-Bengal Railway Administration in the district of Cachar and one in Sibsagar. Trenches and sweepers were provided for conservancy purposes and the water-supplies and accommodation provided are reported to have been satisfactory, but the general health of the labourers in these camps in Cachar was not good, owing to the prevalence of malaria and influenza. There was no mortality from malaria, but out of 285 cases of influenza there were 12 deaths. No construction camps are reported by the Eastern Bengal Railway.

Public Health Laboratory.

36. The subjoined table shows the work performed in the Public Health Laboratory during the year. The examination of all clinical specimens has been transferred to the Pasteur

Institute, hence an apparent diminution in the volume of the work, which however has actually increased. Throughout the year the staff has assisted with the preparation and despatch of the anti-influenza vaccine for which there has been such a large demand in Assam, the officer in charge of the Laboratory, Assistant Surgeon Ram Taran Sen, L.M.S., being also in charge of the Vaccine Section under the Director of the Pasteur Institute.

Chemical analysis of water	104
Examination of *ghee* and fats	7
Examination of milk	18
Examination of mustard oil	92
Examination of other food-stuffs	3
Bacteriological examination of water	201
Examination of vaccine lymphs	321
Examination of mosquitos	3
Examination of antiseptics	5
Miscellaneous	4
Total ...	758

As the control of the Pasteur Institute and with it the Vaccine Section, although borne on the Sanitary Budget, is exercised by the Inspector General of Civil Hospitals, no extensive reference to the work of the Vaccine Section is required in this report. It is however worth recording that 29,807 c.c. of anti-influenza vaccine and 46,560 c.c. of anti-cholera vaccine together with 1,784 c.c. of T. A. B., 750 c.c. of Meningococcus vaccine and 265 c.c. of Mixed Flexner-Shiga vaccine were manufactured and despatched by the Vaccine Section.

The Shillong pipe water-supply was examined weekly, and throughout the year yielded consistently satisfactory analyses, except when the mains or intakes were subjected to interference. The result of the analyses of samples of the municipal water-supplies which are regularly collected by a sample-taker and brought to Shillong on ice shows that the average total count per c.c. of filtered water was over 600 in the case of Tezpur, Jorhat, Sylhet, and Silchar water-supplies, which are derived from mechanical filters, and over 300 in the case of Gauhati which is a slow sand filteration installation. In the case of the mechanical filters the average quantity of water containing organisms indicating foecal contamination was 5 04 c.c. and in the Gauhati water 4·7 c.c. The results indicate the presence of lactose fermenters in a smaller quantity of water than that which is ordinarily believed to indicate efficient filteration, and it seems as if a higher standard of purification should be attained than is at present achieved.

The discovery in Bengal of the adulteration of mustard oil with *pakra* oil containing prussic acid and the resulting prosecutions, seems to have driven much of this dangerous oil into Assam, and, as this was anticipated, our Sanitary Inspectors were directed to be on the lookout for such oil. The result towards the close of the year, and after it, was the receipt in the laboratory of a large number of samples of mustard oil suspected to contain prussic acid, to the use of which symptoms of poisoning were attributed, and in 24 out of 92 such samples, prussic acid was discovered. After the close of the year an inconvenience to which reference was made in last year's report, was rectified by the appointment of the Assistant Surgeon in charge of the Laboratory as Assistant Chemical Examiner to Government, whereby his certificate is now accepted by the law courts as having the force of the certificate of a chemical analyst, and his appearance in support of prosecutions dependant on the evidence of his certificate is no longer necessary.

Emigration.

37. The number of immigrants passing to Assam *viâ* Goalundo by the steamer route was 1,31,433 and that *viâ* Santahar and Amingaon by the railway route was 1,05,375 or a total of 2,36,808 during the year 1919. The emigration season of 1919 was, in many ways, an exceptional one. Recruiting from tea industry reached a very low ebb during the latter years of the war, and the influenza epidemic of the autumn of 1918 greatly depleted the available labour force of the tea industry. In the recruiting districts of Bihar and Orissa, the Central Provinces, and the United Provinces, the partial failure of the grain crops and the resulting scarcity led to very large numbers of labour recruits coming forward for enlistment and these two factors, namely, a big demand and an ample supply, led to the emigration, between December 1918 and June 1919 inclusive, of 239,885 labourers, most of whom were famine-stricken, debilitated people whose condition predisposed them to attacks of epidemic disease.

In the commencement of the emigration season in December and January influenza was prevalent and in February an increasing incidence of cholera, which was brought prominently to notice by some disastrous voyages of infected river steamers, added to our troubles, and strained the resource of our emigration hospitals and staff to the utmost. The voyages of the river steamer "Pegu," which left Goalundo with 666 souls on board, and eventually left Tezpur, when freed from quarantine, having had in all 143 cases of cholera, may be cited as an example of the conditions then prevailing which gave rise to grave apprehensions as to future developments. Under the circumstances, the permission of the Local Administration was obtained for a visit to Calcutta to consult with Lieutenant-Colonel Kennedy, the Chairman, Assam Labour Board, and with Messrs. Beg Dunlop (Secretaries to the Tea Districts Labour Supply Association) as to how the difficulties of the situation might be alleviated. In discussion with Lieutenant-Colonel Kennedy and Mr. Pickford, the advisability of inoculating all labour recruits with anti-cholera vaccine before their departure from the recruiting districts was urged, but in considering the practical details of such arrangement, we were faced with the difficulty that if the accepted ritual of a double dose of anti-cholera vaccine, separated by an interval of ten days, were to be followed it would mean the provision of accommodation in the district recruiting agencies on a scale which would, to all intents and purposes, negative the proposal as a practical proposition. In this dilema, Sir Leonard Rogers' advice was sought as to the value for our purposes of a single inoculation with the idea of conferring some degree of temporary immunity to tide the inoculated emigrants over a period of risk while *en route* to the tea districts. Sir Leonard Rogers lent the weight of his support to this proposal, and Mr. Pickford on behalf of the Tea District Labour Supply Association thereupon set to work to organise the work of inoculating all labour recruits for Assam before their despatch from the recruiting agencies. Many difficulties were encountered, but they were successfully overcome, and by March 16th, inoculation with anti-cholera vaccine obtained from the Central Research Institute, Kasauli, was in force in all the recruiting centres. By the third week in March inoculated coolies began to appear upon the railway routes and by the fourth week of March most of the emigrants travelling to Assam, whether by rail or by river, had been inoculated with a single dose of cholera vaccine before commencing their journey. A marked decrease in the cholera mortality on the transit routes occurred after the introduction of anti-cholera inoculation, which was apparently very largely, if not altogether due to it, and the decrease was of the greatest importance to those who were concerned with the emigration arrangements on the transit routes. Had the mortality remained at its March level or increased to something greater, as might well have happened in the absence of inoculation, the situation would have become well nigh unmanageable, heavy loss of life would have occurred and in view of the grave risk of dissemination of cholera throughout Assam which the continuance of these conditions would have entailed, unrestricted emigration could hardly have been continued owing to the risks, losses and scandals which would have been involved.

Other measures were taken to deal with the situation, thus in view of the heavy cholera mortality on river steamers in February and before the effect of anti-cholera inoculation had asserted itself the erection of quarantine camps at three out of the four ports of inspection, *viz.*, at Dhubri, Gauhati and Tezpur, for the detention of emigrants on heavily infected river steamers and trains, was ordered. Temporary camps providing accommodation for 500 persons were accordingly constructed at considerable expense at these three ports in a very short space of time and in a satisfactory manner. In particular the camp constructed at Tezpur under the personal supervision of the Civil Surgeon, Major McCoy, was a model of efficiency and ingenious extemporisation, and I take this opportunity of acknowledging with gratitude the amount of time and trouble which was expended in its planning and construction. To him, to Lieutenant-Colonel MacLeod at Dibrugarh, to Doctor Bancroft at Dhubri and to Doctor Neogi at Gauhati and to their staff, my thanks as Sanitary Commissioner are due for ungrudging support and painstaking effort in the management of a difficult and exacting emigration season.

Personal proceedings.

33. In January after inspecting *kala-azar* operations and vaccination in Kamrup, I visited Silchar to inspect the Municipality and the district vaccination, and Haflong was visited in connection with a reported prevalence of malaria.

In February Sylhet was visited and inspected and the district vaccination work was overhauled. Calcutta was visited to confer with the Chairman, Assam Labour Board, and Messrs. Begg Dunlop regarding the abnormal mortality on the transit

routes. In this month the special arrangements introduced to meet the abnormal situation necessitated visits to Gauhati and Tezpur and elsewhere.

In March the *kala-azar* work in the district of Nowgong, the district vaccination and the headquarters' Municipality were inspected and thereafter with the inspection of Dibrugarh and of the district vaccination the cold weather touring season terminated.

April, May and June were for the most part spent at headquarters in the preparation of annual reports, inspection of the Shillong Municipality and in routine administrative work.

In July and August the towns of Dhubri and Goalpara were inspected and the emigration arrangements at Goalundo were visited *en route* to Calcutta to attend a conference summoned by the Chairman, Assam Labour Board.

September was spent at headquarters and at the end of October touring was recommenced and the *kala-azar* hospital at Nazira was inspected.

In November the anti-malaria work at Pasighat was inspected and thereafter I returned to Nazira in the Sibsagar district and was engaged till the close of the year in the inspection of the *kala-azar* operations in the Sibsagar and Golaghat subdivisions, the Municipalities of Sibsagar and Jorhat being also inspected.

A review of the work of the year would be incomplete without an acknowledgment of the good work done by my office and in particular by the Head Clerk, Babu Chandra Nath Halder, and the Second clerk, Babu Iswar Chandra Das.

The office establishment is totally inadequate to deal with the volume of work which has to be overtaken and it is only right to accord favourable mention to the efforts which have been made to cope with a disheartening volume of arrears. Proposals for an increase of staff based on the minimum requirements consistent with efficient working have been submitted to Government and their acceptance is awaited.

T. C. McCOMBIE YOUNG, *Major, I.M.S.*,
Sanitary Commissioner, Assam.

SECTION XI.

Annual Report of the Sanitary Board, Assam, for the year 1919.

39. The constitution of the Sanitary Board was the same as in the previous year.

(2) Only one meeting was held during the year, all other business being transacted by the circulation of files and notes.

(3) The following sketch projects were considered by the Board :—

(*a*) Improvement of Gauhati water-works.

The Board approved of the alterations recommended by the Sanitary Engineer and asked the Gauhati Municipality to initiate the scheme.

The Municipality has asked the Sanitary Engineer for a rough estimate.

(*b*) Augmenting the water-supply of Shillong.

The Board considered proposals by the Executive Engineer, Khasi and Jaintia Hills Division, to impound the open stream above Wah Risa intake in order to augment the Shillong water-supply.

The Board resolved that the Secretary consult the Sanitary Commissioner and the Sanitary Engineer and bring the case up before the Board at its next meeting.

(*c*) Remodelling the Tura water-works.

The Board approved of the remodelling proposed by the Sanitary Engineer.

The Secretary, Public Works Department, has asked the Sanitary Engineer for a rough estimate.

(*d*) Extension of the Haflong water-works.

The Board approved of the extensions and alterations proposed by the Sanitary Engineer. Some of the alterations proposed are now being carried out.

(4) The following rough projects were submitted to the Board for consideration and forwarded to Government with recommendations that they be administratively approved :—

(*a*) Reclamation of certain insanitary tanks in Gauhati at an estimated cost of Rs. 2,74,965.

(*b*) Proposals by the Sanitary Commissioner for the organisation of public health administration in rural areas.

(*c*) Proposals by the Sanitary Commissioner for the appointment of additional Sanitary Inspectors.

(5) The following detailed estimate was considered and recommended for sanction, and has since been sanctioned by Government :—

Alterations to the experimental septic tank in Shillong at an estimated cost of Rs. 536.

General.—The Board considered that it should be empowered to state the relative urgency of schemes under consideration for final orders of Government.

The Chief Commissioner accepts the proposal.

A. T. DUGUID,

Secretary, Sanitary Board, Assam.

J. GARVIE,

President, Sanitary Board, Assam.

STATEMENTS.

IMPERIAL STATEMENT No. I.—*Statement showing the birth*

Number.	District.	Population according to the Census of 1911.			Number of births registered.		
		Male.	Female.	Total.	Male.	Female.	Total.
1	2	3	4	5	6	7	8
	SURMA VALLEY.						
1	Cachar	246,205	223,962	470,167	7,793	7,243	15,036
2	Sylhet	1,268,469	1,204,202	2,472,671	36,172	33,416	69,588
	Total	1,514,674	1,428,164	2,942,838	43,965	40,659	84,624
	ASSAM VALLEY.						
3	Goalpara	318,475	282,168	600,643	11,716	11,423	23,139
4	Kamrup	339,398	328,430	667,828	11,754	10,787	22,541
5	Darrang	198,581	178,733	377,314	6,497	6,271	12,768
6	Nowgong	154,938	148,658	303,596	4,999	4,835	9,834
7	Sibsagar	364,810	325,489	690,299	9,785	9,138	18,923
8	Lakhimpur	249,021	219,968	468,989	6,571	6,338	12,909
	Total	1,625,223	1,483,446	3,108,669	51,322	48,792	100,114
	Total for the Province ...	3,139,897	2,911,610	6,051,507	95,287	89,451	184,738

IMPERIAL STATEMENT No. II.—*Statement showing the births and deaths*

Number.	District.	Area, in square miles.	Average population per square mile.	Population (Census of 1911).			Births.		Number of deaths registered.		
				Male.	Female.	Total.	Total number.	Births per 1,000 of population.	Male.	Female.	Total.
1	2	3	4	5	6	7	8	9	10	11	12
	SURMA VALLEY.										
1	Cachar	1,859	253	246,205	223,962	470,167	15,036	31·98	12,881	12,254	25,135
2	Sylhet	5,388	458	1,268,469	1,204,202	2,472,671	69,588	28·14	69,277	61,655	130,932
	Total ...	7,247	406	1,514,674	1,428,164	2,942,838	84,624	28·75	82,158	73,909	156,067
	ASSAM VALLEY.										
3	Goalpara ...	3,954	151	318,475	282,168	600,643	23,139	38·52	14,873	11,800	26,673
4	Kamrup	3,858	173	339,398	328,430	667,828	22,541	33·75	11,894	10,787	22,681
5	Darrang	3,418	110	198,581	178,733	377,314	12,768	33·83	11,797	11,122	22,919
6	Nowgong ...	3,843	79	154,938	148,658	303,596	9,834	32·39	6,647	6,033	12,680
7	Sibsagar ...	4,996	138	364,810	325,489	690,299	18,923	27·41	19,086	17,906	36,992
8	Lakhimpur ...	4,529	103	249,021	219,968	468,989	12,909	27·52	13,383	11,738	25,121
	Total	24,598	126	1,625,223	1,483,446	3,108,669	100,114	32·20	77,680	69,386	147,066
	Total for the Province	31,845	190	3,139,897	2,911,610	6,051,507	184,738	30·52	159,838	143,295	303,133

registered in the districts of Assam during the year 1919.

Ratio of births per 1,000 of population.			Number of males born to every 100 females born.	Excess of births over deaths per 1,000 of population.	Excess of deaths over births per 1,000 of population.	Mean ratio of births per 1,000 during previous five years.		
Male.	Female.	Total.				Male.	Female.	Total.
9	10	11	12	13	14	15	16	17
16·57	15·40	31·98	107	...	21·47	16·22	15·33	31·55
14·62	13·51	28·14	108	...	24·81	16·47	15·25	31·73
14·93	13·81	28·75	108	...	24·28	16·44	15·26	31·70
19·50	19·01	38.52	102	...	5·88	20·72	19·55	40·28
17·60	16·15	33·75	108	...	·21	16·43	15·42	31·85
17 21	16·62	33·83	103	...	26·91	18·25	17·70	35·96
16·46	15·92	32·39	103	...	9·37	16·90	16·04	32·94
14·17	13·23	27·41	107	...	26·17	16·16	15·14	31·31
14·01	13·51	27·52	103	...	26·04	15·15	14·28	29·44
16·50	15·69	32·20	105	...	15·10	17·27	16·32	33·60
15·74	14·78	30·52	106	...	19·57	16·87	15·81	32·68

registered in the districts of Assam during the year 1919.

Number of deaths of males to every 100 deaths of females.	Deaths per 1,000 of population from—											Mean ratio of deaths per 1,000 during the previous five years.		
	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and Diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	All causes.					
									Male.	Female.	Total.	Male.	Female.	Total.
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
105	6·76	·03	...	24·17	3·45	10·00	·27	8·74	52·31	54·71	53·45	27·76	28 66	28·19
112	5·98	·16	...	28·04	2·58	6·81	·33	9·02	54·61	51 19	52·95	29·84	27·74	28 81
111	6·10	·14	...	27·42	2·72	7·32	·32	8·98	54·24	51·75	53·03	29·50	27·88	28·71
126	1·74	·66	...	35·15	·89	3·97	·42	1·55	46·70	41·81	44·40	39·92	37·92	38·98
110	6·55	·13	...	22·12	·96	·62	·33	3·22	35·04	32·84	33·96	32·03	30·15	31·26
106	9·71	·19	...	21·25	6·29	15·03	·42	7·82	59·40	62·22	60 74	39·30	41·09	40 15
110	5·95	·02	...	22·94	1·96	6·53	·24	4·08	42·90	40·58	41·76	32·65	31·09	31·86
106	5·63	·58	...	20·72	6 36	13·30	·36	6·60	52·31	55·01	53·58	30·59	31·62	31·08
114	2·60	·09	...	18·20	7·91	15·15	·39	9·19	53·74	53·36	53·56	32·12	33·25	32·65
111	5·15	·32	...	23·71	3·94	8·60	·36	5·19	47·79	46·77	47·30	34·28	33·82	34·06
111	5·61	·23	...	25·52	3·35	7·98	·34	7·03	50 90	49·21	50 09	31·97	30·91	31·46

IMPERIAL STATEMENT No. III.—*Deaths registered in the*

No.	District.	January.	February.	March.	April.	May.
1	2	3	4	5	6	7
	SURMA VALLEY.					
1	Cachar	2,395	1,815	2,379	3,049	2,008
2	Sylhet	20,478	11,456	9,514	10,363	8,484
	Total	22,873	13,271	11,893	13,412	10,492
	ASSAM VALLEY.					
3	Goalpara	2,707	1,931	2,213	2,627	2,680
4	Kamrup	1,607	1,158	1,257	1,607	2,928
5	Darrang	2,732	1,651	2,171	2,347	2,450
6	Nowgong	953	764	808	768	1,386
7	Sibsagar	2,265	2,355	4,419	4,590	3,174
8	Lakhimpur	2,075	1,653	2,309	2,701	1,935
	Total	12,339	9,512	13,177	14,640	14,553
	Total for the Province	35,212	22,783	25,070	28,052	25,045
	Ratio per 1,000	5·82	3·76	4·14	4·63	4·13

IMPERIAL STATEMENT No. IV.—*Deaths registered according to*

No.	District.	Under 1 year.		1 and under 5.		5 and under 10.		10 and under 15.	
		Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
1	2	3	4	5	6	7	8	9	10
	SURMA VALLEY.								
1	Cachar	1,873	1,539	1,796	1,794	1,238	1,234	712	503
2	Sylhet	10,333	8,686	8,403	8,600	6,541	5,715	3,689	2,676
	Total	12,206	10,225	10,199	10,394	7,779	6,949	4,401	3,239
	ASSAM VALLEY.								
3	Goalpara	3,306	2,687	2,421	2,167	1,425	1,035	767	610
4	Kamrup	2,251	2,084	1,856	1,870	1,439	1,279	751	571
5	Darrang	1,554	1,530	1,597	1,562	900	805	571	489
6	Nowgong	1,222	1,058	1,044	1,044	708	570	452	358
7	Sibsagar	1,927	1,687	3,032	3,101	1,804	1,675	1,080	896
8	Lakhimpur	1,357	1,205	2,019	1,872	1,075	1,082	650	617
	Total	11,617	10,251	11,969	11,616	7,351	6,446	4,271	3,541
	Total for the Province ...	23,823	20,476	22,168	22,010	15,130	13,395	8,672	6,780
	Population	106,330	106,901	356,689	374,837	491,403	482,110	333,555	264,628
	Ratio per 1,000	224 04	191·54	62·14	58·71	30·78	27·78	5·99	25·62

districts of Assam during each month of the year 1919.

June.	July.	August.	September.	October.	November.	December.	Total.
8	9	10	11	12	13	14	15
1,876	2,640	2,499	1,641	1,838	1,490	1,505	25,135
7,766	9,212	10,949	10,896	10,369	10,557	10,888	130,932
9,642	11,852	13,448	12,537	12,207	12,047	12,393	156,067
2,791	2,272	2,253	1,718	1,552	1,894	2,035	26,673
3,458	2,670	1,678	1,461	1,427	1,607	1,823	22,681
2,182	1,953	1,859	1,263	1,428	1,368	1,515	22,919
1,579	1,136	1,298	901	1,041	1,066	980	12,680
3,449	4,016	3,498	2,620	2,662	2,232	1,712	36,992
2,070	2,301	2,440	1,642	2,627	1,816	1,552	25,121
15,529	14,348	13,026	9,605	10,737	9,983	9,617	147,066
25,171	26,200	26,474	22,142	22,944	22,030	22,010	303,133
4·16	4·33	4·37	3·66	3·79	3·64	3·63	50·09

age in the districts of Assam during the year 1919.

15 and under 20.		20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.	
Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
11	12	13	14	15	16	17	18	19	20	21	22
571	794	1,502	2,099	1,718	1,652	1,271	906	947	625	1,253	1,048
3,430	4,193	8,427	10,893	9,216	7,408	6,820	4,289	5,110	3,350	7,308	5,845
4,001	4,987	9,929	12,992	10,934	9,060	8,091	5,195	6,057	3,975	8,561	6,893
679	772	1,442	1,597	1,539	1,049	1,207	639	1,021	561	1,066	683
465	508	1,003	1,268	1,156	1,023	1,073	748	892	659	1,003	777
450	574	1,425	1,818	2,128	2,006	1,482	1,012	979	736	711	590
320	389	635	711	734	665	599	460	475	374	458	404
838	1,052	2,150	31,37	2,945	2,899	2,297	1,522	1,652	993	1,361	944
484	670	1,616	1,963	2,295	1,839	1,901	1,130	1,170	698	816	662
3,236	3,965	8,276	10,494	10,797	9,461	8,559	5,511	6,189	4,021	5,415	4,060
7,237	8,952	18,205	23,486	21,731	18,541	16,650	10,706	12,246	7,996	13,976	10,953
231,893	245,076	526,427	563,035	501,836	399,477	303,554	224,199	167,715	136,717	120,495	114,630
31·20	36·52	34·58	41·71	43·30	46·41	54·85	47·75	73·01	58·48	115·98	95·55

IMPERIAL STATEMENT No. V.—*Deaths registered according*

Number.	District.	Population according to Census of 1911.					
		Christians.	Hindus.	Muhammadans.	Buddhists.	Other classes.	Total.
1	2	3	4	5	6	7	8
	SURMA VALLEY.						
1	Cachar	1,117	305,035	155,653	24	8,338	470,167
2	Sylhet	1,512	1,098,950	1,364,739	20	7,450	2,472,671
	Total	2,629	1,403,985	1,520,392	44	15,788	2,942,838
	ASSAM VALLEY.						
3	Goalpara	5,252	334,720	211,562	955	48,154	600,643
4	Kamrup	2,535	459,227	64,627	574	140,865	667,828
5	Darrang	1,913	245,341	20,305	609	109,146	377,314
6	Nowgong	1,373	177,795	15,689	41	108,698	303,596
7	Sibsagar	5,410	595,266	29,718	1,964	57,941	690,299
8	Lakhimpur	4,789	367,990	13,419	5,648	77,143	468,989
	Total	21,272	2,180,339	355,320	9,791	541,947	3,108,669
	Total for the Province ...	23,901	3,584,324	1,875,712	9,835	557,735	6,051,507

IMPERIAL STATEMENT No. VI.—*Deaths registered from different*

Number.	Districts and towns.	Population according to Census of 1911.	Births.				Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhœa.	Respiratory diseases.
			Male.	Female.	Total.	Birth rate.						
1	2	3	4				5	6	7	8	9	10
	DISTRICTS EXCLUDING TOWNS.											
	SURMA VALLEY.											
1	Cachar	459,920	7,643	7,130	14,773	32·12	3,158	18	...	11,300	1,576	4,655
2	Sylhet	2,441,929	35,668	32,979	68,647	28·11	14,729	402	...	69,026	6,249	16,686
	Total	2,901,849	43,311	40,109	83,420	28·74	17,887	420	...	80,326	7,825	21,341
	ASSAM VALLEY.											
3	Goalpara	588,871	11,519	11,235	22,754	38·64	840	397	...	21,012	460	2,191
4	Kamrup	644,608	11,263	10,353	21,616	33·53	4,169	86	...	14,601	525	152
5	Darrang	371,305	6,410	6,172	12,582	33·88	3,648	71	...	7,983	2,352	5,644
6	Nowgong	298,163	4,903	4,738	9,641	32·33	1,781	7	...	6,907	573	1,944
7	Sibsagar	674,485	9,564	8,937	18,501	27.42	3,861	403	...	14,078	4,359	9,119
8	Lakhimpur	452,781	6,361	6,150	12,511	27·63	1,216	40	...	8,468	3,610	6,976
	Total	3,030,213	50,020	47.585	97,605	32·21	15,515	1,004	...	73,054	11,879	26,026
	Total for districts, excluding towns.	5,932,062	93,331	87,694	181,025	30·51	33,402	1,424	...	153,380	19,704	47,367

to class in the districts of Assam during the year 1919.

Number of deaths registered.						Ratio of deaths per 1,000 of population.					
Christians.	Hindus.	Muhammadans.	Buddhists.	Other classes.	Total.	Christians.	Hindus.	Muhammadans.	Buddhists.	Other classes.	Total.
9	10	11	12	13	14	15	16	17	18	19	20
34	15,753	7,707	3	1,638	25,135	30·43	51·64	49·51	125·00	196·44	53·45
38	52,438	75,750	2	2,704	130,932	25·13	47·71	55·50	100·00	362·95	52·95
72	68,191	83,457	5	4,342	156,067	27·38	48·56	54·89	113·63	275·01	53·03
454	12,?35	9,116	6	4,762	26,673	86·44	36·85	43·08	6·28	98·89	44·40
20	17,204	2,280	1	3,176	22,681	7·89	37·46	35·28	1·74	22·54	33·96
178	14,461	1,264	18	6,998	22,919	93·04	58·94	62·25	29·55	64·11	60·74
82	7,276	1,198	1	4,123	12,680	59·72	40·92	76·35	24·39	37·93	41·76
218	29,327	976	37	6,434	36,992	40·29	49·26	32·84	18·83	111·04	53·58
169	20,614	409	113	3,816	25,121	35·28	56·01	30·47	20·00	49·46	53·56
1,121	101,217	15,243	176	29,309	147,066	52·69	46·42	42·89	17·97	54·08	47·30
1,193	169,408	98,700	181	33,651	303,133	49·91	47·26	52·62	18·40	60·33	50·09

causes in the districts and towns of Assam during the year 1919.

11						12	13	14									15
Injuries.								Ratio of deaths per 1,000 of population.									
Suicide.															From all causes.		
Male.	Female.	Wounds or accidents.	Snakes and wild animals.	Rabies.	Total.	All other causes.	Total.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	For the year.	Mean of previous five years.	Number.
4	2	114	7	...	127	4,028	24,862	6·86	·03	...	24·56	3·?2	10·12	·27	8·75	54·05	28·39	1
26	14	725	56	...	821	21,911	129,824	6·03	·16	...	28·26	2·55	6·83	·33	8·97	53·16	28·88	2
30	16	839	63	...	948	25,939	154,686	6·16	·14	...	27·68	2·69	7·35	·32	8·94	53·30	28·80	
9	3	157	73	...	242	775	25,917	1·42	·67	...	35·68	·78	3·72	·41	1·31	44·01	39·25	3
33	32	73	64	...	202	1,905	21,640	6·46	·13	...	22·65	·81	·23	·31	2·95	33·58	31·24	4
20	5	89	40	...	154	2,961	22,758	9·82	·19	....	21·51	6·33	15·20	·41	7·81	61·29	40·27	5
5	3	29	30	...	67	1,165	12,444	5·97	·02	...	23·16	1·92	6·51	·22	3·90	41·73	31·89	6
66	52	121	11	...	250	4,505	36,575	5·72	·59	...	20·87	6·46	13·51	·37	6·67	54·22	31·25	7
33	28	91	24	...	176	4,168	24,654	2·68	·03	...	18·70	7·97	15·40	·38	9·20	54·45	32·79	8
166	123	560	242	...	1,091	15,419	143,988	5·12	·33	...	24·11	3·92	8·58	·36	5·08	47·51	34·20	
196	139	1,399	305	...	2,039	41,358	298,674	5·63	·24	...	25·85	3·32	7·98	·34	6·97	50·35	31·56	

IMPERIAL STATEMENT No. VI.—*Deaths registered from different Causes*

1	2	3	4				5	6	7	8	9	10
			Births.									
Number.	Districts and towns.	Population according to Census of 1911.	Male.	Female.	Total.	Birth-rate.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhœa.	Respiratory diseases.
	TOWNS.											
	SURMA VALLEY.											
1	Silchar	8,785	122	94	216	24·58	17	...	...	47	41	48
2	Hailakandi	1,462	28	19	47	32·14	7	...	...	19	8	...
3	Sylhet	14,457	246	222	468	32·37	18	...	...	46	119	129
4	Karimganj	3,052	57	31	88	28·83	5	...	...	55	11	4
5	Maulvi Bazar	2,369	51	35	86	36·30	3	...	...	50	1	23
6	Habiganj	6,244	90	78	168	26·90	12	...	...	101	...	...
7	Sunamganj	4,620	60	71	131	28·35	20	...	...	63	9	12
	Total	40,989	654	550	1,204	29·37	82	...	...	381	189	216
	ASSAM VALLEY.											
8	Dhubri	5,808	94	83	177	30·17	201	1	...	31	41	149
9	Goalpara	5,964	103	105	208	34·87	6	...	...	75	37	46
10	Gauhati	12,481	200	195	395	31·64	109	2		94	88	211
11	Barpeta	10,739	291	239	530	49·35	100	...	...	83	32	53
12	Tezpur	5,355	79	88	167	31·18	1	...	...	17	22	27
13	Mangaldai	654	8	11	19	29·05	15	1	...	16	3	1
14	Nowgong	5,433	96	97	193	35·51	26	1	...	59	25	41
15	Sibsagar	5,764	49	57	106	18·39	...	...	...	71	9	...
16	Nazira	2,583	29	26	55	21·29	3	1	...	73	2	...
17	Jorhat	5,231	98	83	181	34·60	2	...	...	56	19	27
18	Golaghat	2,236	45	35	80	35·77	25	1	...	31	3	41
19	Dibrugarb	14,563	186	160	346	23·75	1	1	...	23	98	126
20	North Lakhimpur ...	1,645	24	28	52	31·61	7	...	...	45	5	7
	Total	78,456	1,302	1,207	2 509	31·98	496	8	...	674	384	729
	Total of towns ...	119,445	1,956	1,757	3,713	31·08	578	8	...	1,055	573	945
	Total for the Province ...	6,051,507	95,287	89,451	184,738	30·52	33,980	1,432	...	154,435	20,277	48,312

in the districts and towns of Assam during the year 1919—concluded.

11						12	13	14										15
Injuries.								Ratio of deaths per 1,000 of population.										
Suicide.															From all causes.			
Male.	Female.	Wounds or accidents.	Snakes and wild animals.	Rabies.	Total.	All other causes.	Total.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	For the year.	Mean of previous five years.	Number.
...	...	2	...	...	2	66	221	1·93	...	...	5·35	4·66	5·46	·22	7·51	25·15	19·69	1
...	...	1	1	...	2	16	52	4·78	...	...	12·99	5·47	...	1·36	10·94	35·56	17·09	2
...	...	6	...	...	6	264	582	1·24	...	...	3·18	8·23	8·92	·41	18·26	40·25	26·83	3
...	...	...	...	...	...	27	102	1·63	...	...	18·02	3·60	1·31	...	8·84	33·42	21·95	4
...	...	...	...	...	...	5	82	1·26	...	...	21·10	·42	9·70	...	2·11	34·61	23·63	5
...	...	5	...	...	5	67	185	1·92	...	...	16·17	...	...	·80	10·73	29·62	18·89	6
...	1	...	1	...	2	51	157	4·32	...	...	13·63	1·94	2·59	·43	11·03	33·98	21·42	7
...	1	14	2	....	17	496	1,381	2·00	...	...	9·29	4·61	5·27	·41	12·10	33·69	22·59	
...	...	6	...	...	6	104	533	34·60	·17	...	5·33	7·05	25·65	1·03	17·90	91·76	23·41	8
...	...	6	...	...	6	53	223	1·00	...	...	12·57	6·20	7·71	1·00	8·88	37·39	26·99	9
...	..	17	...	...	17	132	653	8·73	·16	...	7·53	7·05	16·90	1·36	10·57	52·32	24·74	10
...	..	2	...	...	2	118	388	9·31	...	...	7·72	2·97	4·93	·18	10·98	36·13	39·57	11
...	...	1	1	...	2	43	112	·18	...	...	3·17	4·10	5·04	·37	8·02	20·91	29·13	12
1	...	4	...	...	5	8	49	22·93	1·52	...	24·46	4·58	1·52	7·64	12·23	74·92	62·69	13
1	...	4	3	...	8	76	236	4·78	·18	...	10·85	4·60	7·54	1·47	13·98	43·43	30·18	14
...	...	1	...	...	1	15	96	...	...	...	12·31	1·56	...	·17	2·60	16·65	18·91	15
...	...	...	...	...	...	...	79	1·16	·38	...	28·26	·77	...	...	...	30·58	19·74	16
...	...	...	...	...	...	26	130	·38	...	...	10·70	3·63	5·16	...	4·97	24·85	26·95	17
...	...	...	...	...	...	11	112	11·18	·44	...	13·86	1·34	18·33	...	4·91	50·08	33·98	18
...	...	8	...	...	8	150	387	·06	·06	...	1·57	6·72	8·65	·54	8·92	26·57	26·64	19
1	...	...	2	...	3	13	80	4·25	...	...	27·35	3·03	4·25	1·82	7·90	48·63	46·20	20
3	...	49	6	...	58	729	3,078	6·32	·10	...	8·59	4·89	9·29	·73	9·29	39·23	28·46	
3	1	63	8	...	75	1,225	4,459	4·83	·06	..	8·83	4·79	7·91	·62	10·25	37·33	26·44	
199	140	1,462	313	...	2,114	42,583	303,133	5·61	·23	...	25·52	3·35	7·98	·34	7·03	50·09	31·46	

IMPERIAL STATEMENT No. VII.—*Deaths registered from Cholera in the*

Number.	District	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from cholera were reported.	Number in each district.	Number from which deaths from cholera were reported.					
1	2	3	4	5	6	7	8	9	10	11
	SURMA VALLEY.									
1	Cachar	8	8	1,103	192	194	291	737	1,171	429
2	Sylhet	23	23	10,781	2,257	1,659	1,154	2,053	4,200	2,331
	Total	31	31	11,884	2,449	1,853	1,445	2,790	5,371	2,760
	ASSAM VALLEY.									
3	Goalpara	21	16	2,137	120	124	126	96	80	153
4	Kamrup	15	14	1,954	136	74	42	97	391	1,081
5	Darrang	12	11	1,406	457	190	128	436	799	922
6	Nowgong	10	10	1,495	25*	9	12	39	62	398
7	Sibsagar	15	13	2,143	1,032	67	120	977	1,581	535
8	Lakhimpur	13	9	1,702	58	33	49	158	238	176
	Total	86	73	10,837	1,828	497	477	1,803	3,151	3,265
	Total for the Province	117	104	22,721	4,277	2,350	1,922	4,593	8,522	6,025

* Mauzas.

IMPERIAL STATEMENT No. VIII.—*Deaths registered from*

Number.	District	Circles of Registration.		Villages.		January.	February.	March.	April.	May.	June.	July.
		Number in each district.	Number from which deaths from small-pox were reported.	Number in each district.	Number from which deaths from small-pox were reported.							
1	2	3	4	5	6	7	8	9	10	11	12	13
	SURMA VALLEY											
1	Cachar	8	2	1,103	3	1	1	2	5	5	2	1
2	Sylhet	23	10	10,781	143	15	2	14	28	21	66	24
	Total	31	12	11,884	146	16	3	16	33	26	68	25
	ASSAM VALLEY.											
3	Goalpara	21	14	2,137	133	5	12	17	88	116	97	42
4	Kamrup	15	10	1,954	25	1	4	7	5	7	5	4
5	Darrang	12	8	1,406	27	...	3	3	16	4	7	22
6	Nowgong	10	5	1,495	5*	...	...	...	2	1	...	...
7	Sibsagar	15	12	2,143	35	13	52	66	45	46	79	36
8	Lakhimpur	13	8	1,702	14	5	1	4	...	...	9	2
	Total	86	57	10,837	239	24	72	97	156	174	197	106
	Total for the Province ..	117	69	22,721	385	40	75	113	189	200	265	131

* Mauzas.

districts of Assam during each month of the year 1919.

June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
224	95	18	6	13	2	2	1,710	1,472	3,182	6·94	6·57	6·76	1·63	1
1,032	393	124	98	72	511	1,160	8,232	6,555	14,787	6·48	5·44	5·98	2·22	2
1,256	488	142	104	85	513	1,163	9,942	8,027	17,969	6·56	5·62	6·10	2·13	
247	93	37	6	4	69	12	524	523	1,047	1·64	1·85	1·74	2·87	3
1,319	897	148	135	99	73	22	2,152	2,226	4,378	6·34	6·77	6·55	3·39	4
566	362	142	41	39	12	27	1,775	1,889	3,664	8·93	10·56	9·71	3·29	5
529	148	130	121	228	116	15	889	918	1,807	5·73	6·17	5·95	4·18	6
270	112	80	66	43	27	13	1,966	1,925	3,891	5·38	5·91	5·63	2·33	7
98	239	100	19	84	29	1	606	618	1,224	2·43	2·80	2·69	·93	8
3,029	1,851	637	383	497	326	90	7,912	8,099	16,011	4·86	5·45	5·15	2·73	
4,285	2,339	779	492	582	839	1,252	17,854	16,126	33,980	5·68	5·53	5·61	2·45	

Small-pox in the districts of Assam during each month of the year 1919.

August.	September.	October.	November.	December.	Total.			Number of deaths among children.		Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
					Male.	Female.	Total.	Under 1 year.	One to 10 years.	Male.	Female.	Total.		
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
...	...	...	...	1	9	9	18	4	4	·03	·04	·03	·66	1
38	21	7	41	125	235	167	402	35	118	·18	·13	·16	·22	2
38	21	7	41	126	244	176	420	39	122	·16	·12	·14	·29	
10	5	...	1	5	200	198	398	66	180	·62	·70	·66	·75	3
8	11	...	...	36	43	45	88	26	35	·12	·13	·13	1·66	4
3	2	3	1	8	30	42	72	38	18	·15	·23	·19	·35	5
1	4	...	...	...	5	3	8	...	...	·03	·02	·02	·18	6
14	16	14	14	10	225	180	405	21	32	·61	·55	·58	·90	7
6	1	6	1	6	25	16	41	...	2	·10	·07	·09	·13	8
42	39	23	17	65	528	484	1,012	151	267	·32	·32	·32	·78	
80	60	30	58	191	772	660	1,432	190	389	·24	·22	·23	·54	

IMPERIAL STATEMENT No. IX.—*Deaths registered from Fevers*

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from fevers were reported.	Number in each district.	Number from which deaths from fevers were reported.					
1	2	3	4	5	6	7	8	9	10	11
	SURMA VALLEY.									
1	Cachar	8	8	1,103	452	809	513	546	759	760
2	Sylhet	23	23	10,781	8,442	6,164	4,932	3,818	3,410	3,834
	Total	31	31	11,884	8,894	6,973	5,445	4,364	4,169	4,594
	ASSAM VALLEY.									
3	Goalpara	21	21	2,137	2,132	1,667	1,409	1,549	1,977	2,139
4	Kamrup	15	15	1,954	1,377	1,268	847	862	959	1,585
5	Darrang	12	12	1,406	1,406	157	707	850	684	421
6	Nowgong	10	10	1,495	54*	395	495	491	396	595
7	Sibsagar	15	15	2,143	2,129	854	809	1,087	1,141	1,165
8	Lakhimpur	13	13	1,702	1,550	954	485	502	751	536
	Total	86	86	10,837	8,648	5,295	4,752	5,341	5,908	6,441
	Total for the Province ...	117	117	22,721	17,542	12,268	10,197	9,705	10,077	11,035

* Mauzas.

IMPERIAL STATEMENT No. X.—*Deaths registered from*

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from dysentery and diarrhœa were reported.	Number in each district.	Number from which deaths from dysentery and diarrhœa were reported.					
1	2	3	4	5	6	7	8	9	10	11
	SURMA VALLEY.									
1	Cachar	8	7	1,103	162	96	96	109	171	160
2	Sylhet	23	22	10,781	1,907	667	450	443	514	531
	Total ...	31	29	11,884	2,069	763	546	552	685	691
	ASSAM VALLEY.									
3	Goalpara	21	17	2,137	152	14	12	13	29	94
4	Kamrup	15	14	1,954	140	27	18	42	52	60
5	Darrang	12	11	1,406	168	45	95	115	178	213
6	Nowgong	10	10	1,495	33*	25	20	28	52	51
7	Sibsagar	15	15	2,143	1,323	87	125	309	326	375
8	Lakhimpur	13	12	1,702	399	78	113	174	375	451
	Total	86	79	10,837	2,215	276	383	681	1,012	1,244
	Total for the Province...	117	108	22,721	4,284	1,039	929	1,233	1,697	1,935

* Mauzas.

in the districts of Assam during each month of the year 1919.

June.	July.	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1,152	1,677	1,669	1,008	879	743	851	5,806	5,560	11,366	23·58	24·82	24·17	14·06	1
4,670	6,441	8,202	7,788	7,314	6,350	6,418	37,028	32,313	69,341	29·19	26·83	28·04	14·10	2
5,822	8,118	9,871	8,796	8,193	7,093	7,269	42,834	37,873	80,707	28·27	26·51	27·42	14·09	
2,078	1,904	2,055	1,578	1,396	1,586	1,780	11,862	9,256	21,118	37·24	32·80	35·15	32·72	3
1,904	1,438	1,203	1,066	1,012	1,202	1,432	7,838	6,940	14,778	23·09	21·13	22·12	20·83	4
856	802	778	558	663	732	813	4,172	3,849	8,021	21·00	21·53	21·25	20·81	5
742	706	705	460	540	688	753	3,721	3,245	6,966	24·01	21·82	22·94	19·79	6
1,798	1,890	1,524	1,194	1,245	901	701	7,499	6,810	14,309	20·55	20·92	20·72	14·20	7
836	741	857	560	918	774	622	4,529	4,007	8,536	18·18	18·21	18·20	13·91	8
8,214	7,481	7,122	5,416	5,774	5,883	6,101	39,621	34,107	73,728	24·37	22·99	23·71	20·51	
14,036	15,599	16,993	14,212	13,967	12,976	13,370	82,455	71,980	154,435	26·26	24·72	25·52	17 39	

Dysentery and Diarrhœa in the districts of Assam during each month of the year 1919.

June.	July.	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
137	188	172	140	157	111	88	873	752	1,625	3·54	3·35	3·45	2·08	1
492	474	495	497	562	681	583	3,574	2,815	6,389	2·81	2·33	2·58	2·02	2
629	662	667	637	719	792	671	4,447	3,567	8,014	2·93	2·49	2·72	2·03	
171	76	36	26	25	24	18	300	238	538	·94	·84	·89	·36	3
70	94	87	51	60	40	44	389	256	645	1·14	·77	·96	1·01	4
256	294	310	245	240	190	196	1,338	1,039	2,377	6·73	5·81	6·29	3·87	5
89	66	68	51	64	53	31	342	256	598	2·20	1·72	1·96	1·68	6
452	532	486	428	446	494	332	2,435	1,957	4,392	6·67	6·01	6·36	4·32	7
353	358	407	353	460	360	231	2,088	1,625	3,713	8·38	7·38	7·91	4·58	8
1,391	1,420	1,394	1,154	1,295	1,161	852	6,892	5,371	12,263	4·24	3·62	3·94	2·57	
2,020	2,082	2,061	1,791	2,014	1,953	1,523	11,339	8,938	20,277	3·61	3·06	3·35	2·31	

IMPERIAL STATEMENT No. XI.—*Deaths registered from*

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from respiratory diseases were reported.	Number in each district.	Number from which deaths from respiratory diseases were reported.					
1	2	3	4	5	6	7	8	9	10	11
	SURMA VALLEY.									
1	Cachar	8	7	1,103	92	892	603	701	615	362
2	Sylhet	23	22	10,781	613	8,815	2,761	1,286	596	317
	Total ...	31	29	11,884	705	9,707	3,364	1,937	1,211	679
	ASSAM VALLEY.									
3	Goalpara	21	17	2,137	65	829	302	427	379	114
4	Kamrup	15	13	1,954	92	50	68	70	39	23
5	Darrang	12	11	1,406	492	2,126	553	582	474	654
6	Nowgong	10	10	1,495	26*	424	152	159	159	254
7	Sibsagar	15	12	2,143	443	982	1,023	1,687	1,164	700
8	Lakhimpur	13	13	1,702	173	740	713	1,154	1,023	434
	Total ...	86	76	10,837	1,291	5,151	2,811	4,079	3,238	2,179
	Total for the Province ...	117	105	22,721	1,996	14,858	6,175	6,066	4,449	2,858

* Mauzas.

IMPERIAL STATEMENT No. XII.—*Deaths registered from Plague*

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from plague were reported.	Number in each district.	Number from which deaths from plague were reported.					
1	2	3	4	5	6	7	8	9	10	11
	SURMA VALLEY.									
1	Cachar	8	...	1,103	...	...	...	...	...	...
2	Sylhet	23	...	10,781	...	...	...	...	...	...
	Total ...	31	...	11,884	...	...	...	...	...	...
	ASSAM VALLEY.									
3	Goalpara	21	...	2,137	...	...	...	...	...	...
4	Kamrup	15	...	1,954	...	...	...	...	...	...
5	Darrang	12	...	1,406	...	...	...	...	...	...
6	Nowgong	10	...	1,495	...	...	...	...	...	...
7	Sibsagar	15	...	2,143	...	...	...	...	...	...
8	Lakhimpur	13	...	1,702	...	...	...	...	...	...
	Total ...	86	...	10,837	...		...	...	...	...
	Total for the Province ...	117	...	22,721	...		...	...	...	...

Respiratory diseases in the districts of Assam during each month of the year 1919.

June.	July.	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
112	308	265	146	350	214	135	2,413	2,290	4,703	9·80	10 22	10·00	2·28	1
226	408	446	684	343	634	338	8,650	8,204	16,854	6·81	6·81	6 81	1·62	2
338	716	711	830	693	848	473	11,063	10,494	21,557	7·30	7·34	7·32	2·24	
102	71	33	20	21	54	34	1,311	1,075	2,386	4·11	3·80	3·97	·56	3
23	30	27	11	20	27	28	252	164	416	·74	·49	62	44	4
262	187	293	139	163	110	129	3,022	2,650	5,672	15·21	14·82	15·03	4·93	5
111	92	288	162	72	65	47	1,011	974	1,985	6·52	6·55	6 53	1·99	6
472	968	900	407	371	257	256	4 741	4,446	9,187	12 99	13·65	13·30	3·86	7
400	533	609	314	590	317	282	3,845	3,264	7,109	15·44	14·83	15·15	5·84	8
1,370	1,881	2,150	1,053	1,237	830	776	14,182	12,573	26,755	8·72	8·47	8·60	2·77	
1,708	2,597	2,861	1,883	1,930	1,678	1,249	25,245	23,067	48,312	8 04	7·92	7·98	2·24	

in the districts of Assam during each month of the year 1919.

June.	July.	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	...	...	...	...	...	...	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	

APPENDIX II.

PROVINCIAL.

Statement showing details of registration in compulsory areas.

Compulsory registration area.	Population according to Census of 1911.	Estimated births at 286 per 1,000 married women between the ages of 15 and 40.	Number of births registered during the year.	Estimated birth-rate per mille.	Registered birth-rate per mille.	Number of deaths registered during the year.		Death-rate per mille.		Number of prosecutions under Act IV (B.C.) of 1873.	Number of convictions.
						Including deaths in hospitals.	Excluding deaths in hospitals.	Including deaths in hospitals.	Excluding deaths in hospitals.		
1	2	3	4	5	6	7	8	9	10	11	12
Silchar	8,785	296	216	33·69	24·58	221	160	25·15	18·21	...	...
Hailakandi	1,462	45	47	30 78	32·14	52	35	35·56	23·93	2	1
Sylhet	14,457	582	468	40·26	32·37	582	517	40·25	35·76	18	15
Karimganj	3,052	260	88	39·92	28·83	102	82	33 42	28·86	31	28
Maulvi Bazar	2,369	77	86	32 50	36 30	82	74	34·61	31·23	8	7
Habiganj	6,244	222	168	35·55	26·90	185	167	29 62	26·74	8	2
Sunamganj	4,620	145	131	31·38	28·35	157	147	33·98	31·81	33	30
Dhubri	5,808	191	177	32·88	30·47	533	495	91·76	85·22	46	32
Goalpara	5,964	197	208	33·03	31·87	223	204	37·39	34·20	13	11
Ganhati	12,481	409	395	32·77	31·64	653	520	52·32	41·66	30	23
Barpeta	10,739	482	530	44·88	49·35	388	380	36·13	35·38	35	10
Tezpur	5,355	167	167	31·18	31·18	122	92	20·91	17·18	16	15
Mangaldai	654	*	19	*	29·05	49	34	74·92	51·98	4	3
Nowgong	5,433	185	193	34·05	35·51	236	183	43·43	33 68	24	21
Sibsagar	5,764	213	106	36·95	18·39	96	82	16·65	14·22	25	20
Nazira	2,583	*	55	*	21·29	79	79	30·58	30·58	33	24
Jorhat	5,231	192	181	36·70	34·60	130	105	24·85	20·07	20	18
Golaghat	2,236	88	80	39·35	35·77	112	87	50·08	38·90	40	4
Dibrugarh	14,563	543	346	37·28	23·75	387	217	26·57	14·90	38	23
North Lakhimpur... ...	1,645	*	52	*	31·61	80	66	48·63	40·12	...	...
Total ...	119,445	4,294	3,713	34·96	31·08	4,469	3,726	37·41	31·19	424	287

* Not available.

Resolution on the Annual Sanitary Report of the Province of Assam for the year 1919.

Extract from the Proceedings of the Chief Commissioner of Assam in the Municipal Department, No. 3824M., dated the 24th June 1920.

READ—

The Sanitary Report for the year 1919.

RESOLUTION.

1. Climatic and economic conditions were unfavourable and the year was an exceptionally unhealthy one. The death-rate was regrettably high, being 50·09 per mille, as compared with 46·10 in the preceding year and 31·46 in last quinquennium. The corresponding figures for the birth-rate were 30·52, 34·98 and 32·68. Mortality on tea gardens was especially heavy. This is hardly a matter for surprise, as some quarter of a million labourers were imported, when epidemics were rife, from districts in which scarcity was common.

The tea industry has lately been addressed by the Local Administration about the extended use of a scientific system of sanitation. It is hoped that the result will be a reduction in deaths from dysentery and diarrhœa.

2. The mortality from all the principal diseases except small-pox was above that of the decennium 1909-18. As in previous years the highest mortality is recorded against "fever." It is not possible to determine what proportion of the deaths put down to fever was due to influenza, which was particularly prevalent during the first three months of the year. An indirect result of the influenza epidemic was to lessen the power of resistance against other disease.

Anti-malarial measures are in progress at Pasighat and Lumding; they promise good results.

There was no serious epidemic of small-pox. Nowgong district was almost immune from this disease. It is worthy of note that it is a district in which particular attention is being given to vaccination.

3. Recorded deaths from *kala azar* were materially fewer than in 1918. Measures of segregation and removal from infected sites continued to be carried out; they were notably successful in those villages of the Sibsagar Subdivision to which they were applied as early as in 1917.

The general introduction of the treatment of *kala-azar* by intravenous injection of tartar emetic is a feature of the year's work which calls for special mention. The treatment was given in the new *kala-azar* hospital at Nazira and through travelling dispensaries. It is gratifying that it has gained the public confidence.

Sir Nicholas Beatson Bell long ago gave orders that the money needed for fighting this disease must be found, and he takes this opportunity of repeating that expenditure needed for carrying on and widely extending the work will not be grudged.

The Chief Commissioner attaches special importance to the co-operation of the district medical staff with the Sanitary Commissioner and his staff. He specially thanks those officers (from the Director of the Pasteur Institute and Civil Surgeons to Sub-Assistant Surgeons) whose good work is mentioned by the Sanitary Commissioner.

4. A scheme for water-works at Dhubri has lately been sanctioned. No other large sanitary scheme is now in progress. Practically all the large towns in the Province now have water-works. These are on the whole working well; it is hoped that such defects as exist will be remedied.

Though Government was unable in 1917-18 and 1918-19 to give grants for the improvement of water-supply in rural areas, substantial grants were given from April 1919 onwards and it is hoped that Local Boards will now contribute their full share.

Proposals made by the Sanitary Commissioner for the employment of a staff of rural health officers have been accepted by the Chief Commissioner. Partial effect will be given to the scheme in the present year.

5. The account given of the work done by the Provincial Public Health Laboratory is interesting. It is satisfactory that it was possible to manufacture on a very large scale both anti-cholera and anti-influenza vaccine.

There is little doubt that the great drop in mortality from cholera among immigrants to tea gardens was largely due to the fact that most of them were inoculated before they began their journey.

6. The Chief Commissioner's thanks are due to Major McCombie Young for his careful administration of the Department, and to the President and Members of the Sanitary Board for the help given by them during the year.

ORDERED that the Resolution and the Report be published in the *Assam Gazette*.

By order of the Chief Commissioner of Assam,

A. R. EDWARDS,

Second Secretary to the Chief Commissioner.

A. S. P. O. (M. & E.) No. 12—301—28-6-1920—A. E. R.